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Articles to Appear Soon

Analysis of and Testing in Common Fractions by *Arthur W. Kallom.*

A Proposed Index of Efficiency in Teaching History by *B. R. Buckingham.*

Rating Teachers by Results by *Wm. L. Connor.*

What First Grade Children Can do in School as Related to What is Shown by Mental Tests by *Virgil E. Dickson.*

Psychological Tests as a Means of Measuring the Probable School Success of High School Pupils by *W. M. Proctor.*

A. State-Wide School-Building Survey by *George Drayton Strayer.*

A Shorter Method for Computing the Coefficient of Correlation by *Leonard P. Ayres.*

Journal of Educational Research

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VOLUME I — FEBRUARY, 1920 — NUMBER 2

IMPROVEMENT IN SCHOOL SUBJECTS THROUGHOUT THE SCHOOL YEAR

V. A. C. HENMON
University of Wisconsin

The nature, amount, and rate of improvement in the case of relatively simple functions has been studied in some detail. The more complex abilities in school subjects have scarcely been touched. In discussing improvement in informational, appreciative, analytic, and selective functions, Thorndike pertinently remarks: "It is a noteworthy commentary on the newness of scientific study of education that nobody has yet measured the actual progress of any single child in learning any school subject for over a month, or in learning any of the informational subjects for even a week."[1] Standardized tests which might be used for such measurement are now available in most of the subjects of the elementary school curriculum and in some secondary subjects. Ordinarily they have been administered in September and June and comparisons have been made with norms at the beginning and end of the school year. Numerous questions arise that can not be answered by measurements made at such intervals. What are the amount and rate of progress throughout the year? Is the improvement, which is practically always found, uniform, or is the improvement rapid in the early part of the year with a gradual tapering off toward the close, or is the improvement slow at first and more rapid as the year advances? Are there plateaus in the progress curve? How do school subjects vary in improvability, both as to nature, amount, and rate of gain, and as to the

[1] Thorndike, E. L. *Educational psychology.* New York: Teachers College, 1913, Volume II: "Psychology of learning," p. 333.

factors and conditions which determine them? How do individuals differ in improvement? These and many other questions require more frequent and detailed records of progress than have hitherto been available.

The problem of studying improvement in school subjects throughout the year by means of standardized tests given at monthly intervals was proposed to Mr. L. J. Coubal, Principal of the Alice School, Hibbing, Minnesota, in 1915, as a thesis for a bachelor's degree. A portion of the material was later used by Mr. Edward Van Landegend for a study of individual differences in improvement. The results of both studies are so striking as to deserve wider publicity.

Tests were given to 32 pupils of the second grade, 33 of the third grade, 25 of the fourth grade, 18 of the fifth grade, and 20 of the sixth grade. Rate and comprehension in reading were measured by Starch's tests in the fourth grade only, as alternative tests could not be provided for all the other years. The scores for rate are in terms of the number of words read per second and for comprehension in terms of the number of words correctly reproduced. Rate of writing was determined for all the grades, and the quality was rated by the Ayres scale. Starch's spelling tests, consisting of one hundred words, were given to all the grades, the scores giving the number of words correctly spelled out of one hundred. Ability in addition, subtraction, multiplication, and division were measured by the Courtis Standard Research Tests, Series B, Forms 1, 2, and 3, in the fourth, fifth, and sixth grades. The tests, except in arithmetic, were given by the teachers under very specific directions, the principal also being present. The tests in arithmetic were all given by the principal of the school.

The results of the tests appear in Tables Ia to Ie inclusive.

TABLE Ia. RESULTS OF TESTS. GRADE II

	Sept. 16	Oct. 14	Nov. 14	Dec. 8	Jan. 20	Feb. 17	Mar. 16	Apr. 13	May 11	Gain thru Year	STANDARD SCORES FOR TESTS	
											Sept.	June
Writing:												
Rate	.....	10.9	10.4	27.5	24.8	33.8	25.9	31.9	33.1	22.2	20	31
Quality	.....	27.0	27.0	25.7	25.2	30.0	33.4	33.4	35.8	8.8		27
Spelling	6.5	10.0	11.4	12.7	17.2	24.5	22.6	29.2	25.6	19.1	10	30

TABLE Ib. RESULTS OF TESTS. GRADE III

	Sept. 16	Oct. 14	Nov. 11	Dec. 8	Jan. 20	Feb. 17	Mar. 16	Apr. 13	May 11	Gain thru Year	STANDARD SCORES FOR TESTS	
											Sept.	June
Writing:												
Rate	.....	47.0	44.0	56.7	51.0	48.3	53.8	48.6	51.8	4.8	31	38
Quality	.....	37.0	39.0	43.0	28.4	39.2	33.3	35.0	32.4	−4.6	27	33
Spelling	28.9	28.7	30.6	32.4	30.2	35.4	40.2	45.7	51.0	22.1	30	40

TABLE Ic. RESULTS OF TESTS. GRADE IV

	Sept. 16	Oct. 14	Nov. 11	Dec. 8	Jan. 20	Feb. 17	Mar. 16	Apr. 13	May 11	Gain thru Year	STANDARD SCORES FOR TESTS	
											Sept.	June
Reading:												
Rate	1.5	2.5	2.2	2.3	2.2	2.5	2.7	3.1	3.1	1.6	2.1	2.4
Comprehension	31.0	23.2	32.7	36.3	36.4	40.9	40.1	40.1	40.4	9.4	24.0	28.0
Writing:												
Rate	.....	49.5	53.1	49.9	57.7	51.3	65.2	52.6	54.7	5.2	38.0	47.0
Quality	.....	36.4	37.0	43.8	38.9	43.5	42.1	44.7	48.0	11.6	33.0	37.0
Spelling	41.1	49.2	39.0	48.7	45.7	49.6	55.4	56.1	56.7	15.6	40.0	51.0
Arithmetic:												
Addition A	5.7	5.0	6.4	7.8	7.4	8.5	10.4	12.5	11.5	5.8	4.0	6.0
Addition R	2.3	2.7	3.1	4.5	4.1	4.6	7.0	8.5	6.5	4.3	2.0	3.0
Subtraction A	4.4	3.8	5.4	5.8	6.5	7.2	8.8	9.8	10.8	6.4	4.0	6.0
Subtraction R	1.4	1.4	3.0	3.7	4.5	5.3	6.5	8.0	8.0	6.6	1.0	3.0
Multiplication A	3.5	3.5	3.7	5.0	5.6	6.0	7.5	8.4	9.1	5.6	.....	4.5
Multiplication R	1.1	1.8	1.3	2.8	3.5	3.0	5.0	5.5	6.4	5.3	.....	1.5
Division A	.....	.....	.....	3.1	4.4	4.4	5.1	6.5	8.2	8.2	.....	2.5
Division R	.....	.....	.....	0.9	0.9	0.9	2.1	5.0	6.2	6.2	.....	1.0

Complete results in reading, writing, spelling, and arithmetic were available for the fourth grade. In Figures 1–7 solid lines show graphically the progress for this grade from September to May. The standard September and June scores for these tests are shown by dashed lines. In these figures the letters along the base line refer to the months from September to May. No September scores are available for multiplication and division. Hence no dashed lines appear in Figures 6 and 7. June scores are indicated by a point at the right of each of these figures. Since the curves for the other grades show similar tendencies, the records of the fourth grade only will be used for this discussion.

TABLE Id. RESULTS OF TESTS. GRADE V

	Sept. 16	Oct. 14	Nov. 14	Dec. 8	Jan. 20	Feb. 17	Mar. 16	Apr. 13	May 11	Gain thru Year	STANDARD SCORES FOR TESTS	
											Sept.	June
Writing:												
Rate	.....	58.3	67.0	69.2	63.0	50.6	51.4	53.8	59.0	0.7	47.0	57.0
Quality	.....	37.6	45.6	47.5	47.1	46.0	49.3	48.0	52.3	14.7	37.0	45.0
Spelling	54.0	65.7	62.2	64.9	58.6	61.0	70.1	68.3	71.3	17.3	51.0	61.0
Arithmetic:												
Addition A	8.2	8.2	10.6	10.2	10.8	11.9	13.5	15.1	14.5	6.3	6.0	7.5
Addition R	5.2	5.0	6.9	7.0	7.1	8.1	11.2	12.5	10.2	5.0	3.0	4.0
Subtraction A	6.9	5.8	8.7	8.8	10.1	11.5	14.6	14.2	16.2	9.3	6.0	8.0
Subtraction R	4.6	4.8	6.4	6.1	8.5	9.0	12.0	11.8	13.6	9.0	3.0	5.5
Multiplication A	4.3	4.0	7.5	8.0	8.8	9.7	10.3	14.3	12.8	8.5	4.5	7.0
Multiplication R	1.8	1.7	4.9	4.3	5.4	6.3	7.6	11.5	9.6	7.8	1.5	4.0
Division A	4.0	4.0	7.7	8.1	6.4	10.0	11.6	15.2	13.8	9.8	3.5	5.0
Division R	1.4	1.9	5.2	5.6	4.1	7.5	10.1	14.1	12.3	10.9	1.0	3.0

TABLE Ie. RESULTS OF TESTS. GRADE VI

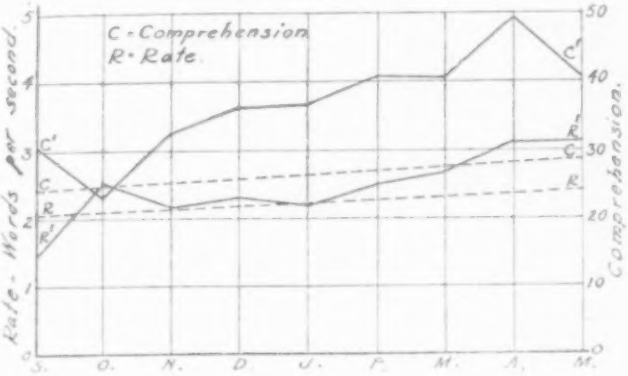
	Sept. 16	Oct. 14	Nov. 14	Dec. 8	Jan. 20	Feb. 17	Mar. 16	Apr. 13	May 11	Gain thru Year	STANDARD SCORES FOR TESTS	
											Sept.	June
Writing:												
Rate	.....	70.0	81.0	76.2	63.7	57.5	62.1	56.5	59.6	—10.4	57.0	65.0
Quality	.....	46.7	53.7	55.5	54.3	55.8	57.2	57.3	61.1	14.4	43.0	53.0
Spelling	62.4	60.2	68.7	69.9	60.8	65.3	75.3	75.7	80.7	18.3	61.0	71.0
Arithmetic:												
Addition A	8.8	8.2	10.1	10.0	9.3	10.3	12.3	14.0	13.8	5.0	7.5	9.0
Addition R	5.6	4.8	7.1	6.3	6.2	7.0	10.0	11.5	10.3	4.7	4.0	5.0
Subtraction A	6.5	7.3	8.7	8.8	8.8	10.0	12.1	12.9	13.4	6.9	8.0	10.0
Subtraction R	4.8	5.3	7.1	6.7	7.8	8.6	11.1	12.0	11.8	7.0	5.5	7.0
Multiplication A	6.4	7.1	8.9	9.0	8.7	9.6	10.8	12.0	12.5	6.1	7.0	8.5
Multiplication R	4.6	5.2	6.9	5.6	7.4	7.9	9.1	10.0	9.4	4.8	4.0	5.5
Division A	4.8	5.6	7.5	6.8	8.4	8.8	12.0	12.4	13.4	8.6	5.0	6.5
Division R	3.8	4.3	6.4	5.9	7.5	7.4	10.4	11.0	12.9	9.1	3.0	5.0

The primary purposes of this study were (1) to measure as exactly as possible the amount of improvement throughout the year, and in particular to discover the effects of experimental conditions; (2) to find the typical curve of progress, if there is one, under such conditions; (3) to compare differences in rate of progress in different school subjects; and (4) to secure data on the

effects of equal practice on individual differences. It was thought that the giving of the tests at regular intervals might be a valuable incentive and moreover would be of great use to a supervisor in diagnosing defects in individuals and detecting inequalities in emphasis or other irregularities.

·FIG 1·

·READING·



·FIG 2·

·WRITING·

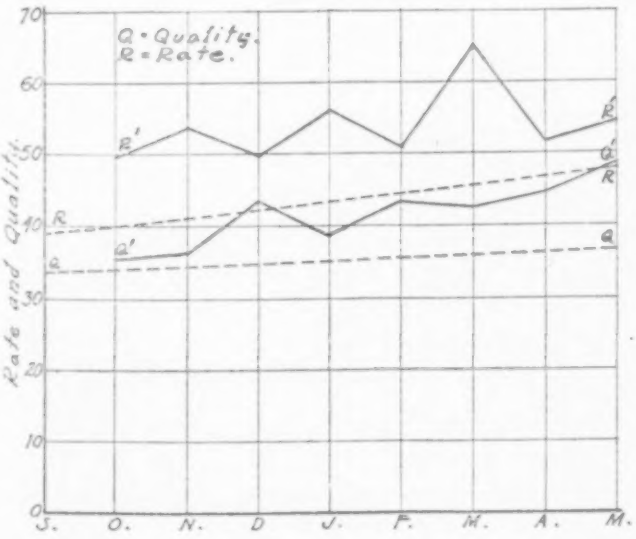


FIG 3.
SPELLING.

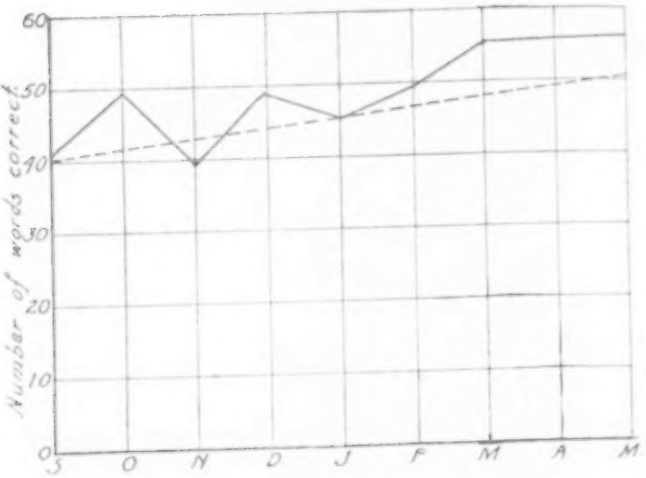


FIG 4.
ADDITION.

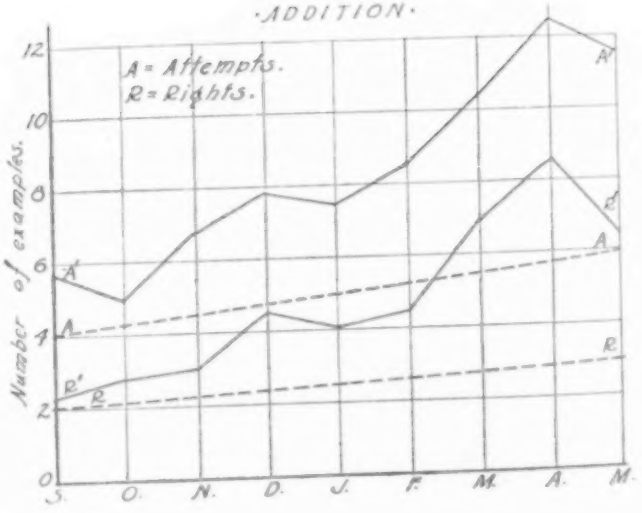


FIG 5

·SUBTRACTION·

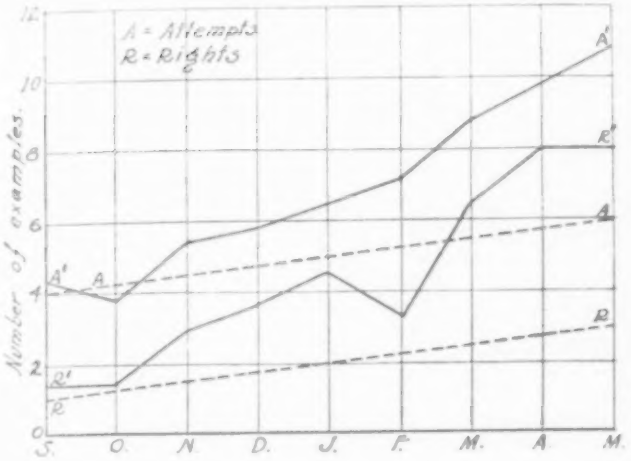
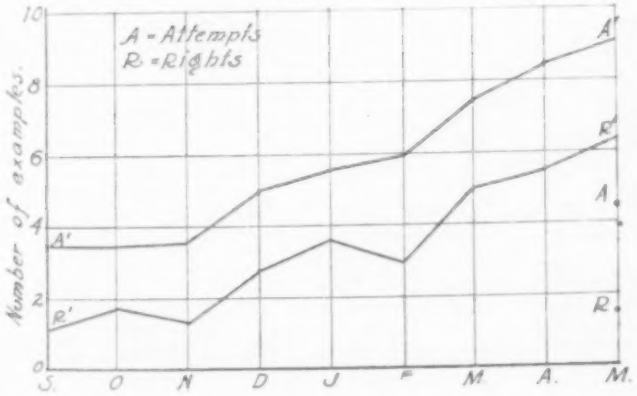


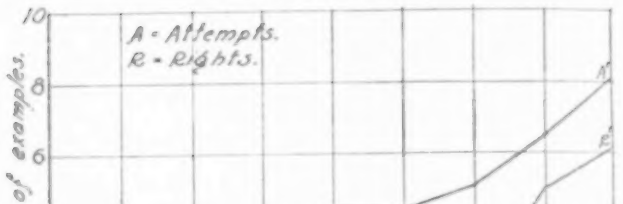
FIG 6

·MULTIPLICATION·



·FIG·7·

·DIVISION·



The figures and tables bring out certain significant facts: 1. *The astonishingly great amount of improvement.*—The effect of applying the tests at regular intervals throughout the year is nothing short of remarkable. This fourth grade group of 25 pupils began the year with scores approximating closely the standards. At the end of the year the gains exceeded all expectations. In rate of reading the initial score of 1.5 words per second in September is considerably below the standard, while the May score of 3.1 words attains the standard of the sixth grade. In comprehension the initial score of 31 words reproduced is above the standard considerably, rate having been sacrificed for comprehension in the first month, while the May score of 40.4 words is again that of the sixth grade. In spelling the September score of 41.1 words is very close to the standard, while the May score of 56.7 words is almost that of the fifth grade. In writing the initial scores approximate closely the standard June scores for the grade, while the final score for rate is that of the fifth grade and for quality midway between those of the fifth and sixth grades. In the four fundamental operations the gains are even more striking. The number of rights runs in addition from 2.3 to 6.5 (standards 2.0 to 3.0), in subtraction from 1.4 to 8.0 (standards 1.0 to 3.0), in multiplication from 1.1 to 6.4 (June standard 1.5) and in division the final score is 6.2 (standard 1.0). The final scores in

arithmetic in attempts and rights are in all cases above the standards of the sixth grade and in many cases are above those of the seventh grade. When it is borne in mind that selection by eliminating the poorer pupils accounts in some measure for the increase in the standard scores from year to year, the effect is all the more noteworthy.

It should be noted also that the gain in one subject is not due to overemphasis upon it and accounted for in part by loss in other subjects. The results of a very large share of the instruction of the fourth grade were measured and large gains are shown in every case. Nor is the increase due to constant drill. When a test was completed it was put aside and not used again till the end of the next month. No alteration was made in the work of the school except for the monthly tests. The regular work of the fourth grade involves a five to ten minute daily exercise in the four fundamental operations in arithmetic.

The results are in accord with those attained in laboratories which have always shown very great improvement with practice under experimental conditions even in traits which in the ordinary circumstances of life have been much subject to practice. Laboratory experiments in memorizing, for instance, have shown very great gains under experimental conditions by those who have memorized more or less all their lives and whose capacities might be supposed to have been brought near the limits of improvement. In sharp contrast is the rate of improvement ordinarily found in school children as is indicated by the relatively small gain from September to June in the standard scores.

Certain practical applications of these results suggest themselves. Would it not be desirable to place a great deal of school work in the form of a practice experiment in which the pupil tested himself at regular intervals by objective methods, kept his own score, and watched his gain or loss from week to week or month to month? All experiments show that this would be an extraordinary stimulus to effort. The individual would be competing not with others but with his own past performances. Why should not a pupil record at intervals how fast he reads, how much he comprehends and recalls, how well he writes and spells, where he stands in composition, how many words he knows in a foreign language, how rapidly and accurately he can

read or translate, how long he must study a lesson assignment, etc.? The results of these experiments in one school show that the experimental conditions subjected the school to a healthy strain and that an amount of improvement resulted greater than any that has to my knowledge been reported.

2. *The rate of improvement.*—An inspection of the figures for the fourth grade as well as for the other grades shows that progress throughout the year is not one of uniform growth. No single curve or generalization describes all of the facts, but a curve with a long slow rise during the first half or two-thirds of a year, with a rapid rise during the last third, fits the facts tolerably well. This curve differs markedly from the typical learning curve which shows a rapid rise at first, followed by a period of no gain or of slow gain. Comparisons with the typical learning curve, where relatively new coordinations are set up, can, of course, not be fairly made since these curves of progress in school subjects are but segments of larger curves. Whether the typical curve of progress in school subjects is the one found so frequently in these records, it will require further experimentation to determine. It will also require further experimentation to determine how far the long plateau period in the early part of the year is necessary. It is quite possible that changes in methods and devices, or furnishing other stimulations, might bring about greater improvement earlier in the year. At any rate the facts stand out pretty sharply, challenge one's interest, and invite to further study.

3. *The differences in rate of improvement in the different subjects.*—The least improvement is in spelling ability; the greatest in arithmetic, particularly in addition, both in rate and accuracy. These results agree with those of Kirby.[2] Arithmetical operations reduce to a definite number of combinations, which recur frequently, are easily isolated and made the subject of training; the associations required in spelling occur less frequently and would show a less rapid improvement. We are just at the beginning of the study of such differences as these in school subjects, the types of learning they represent, and the factors and conditions of improvement. The nature and rate of improvement in history and geography differ no doubt in important respects

[2] Kirby, T. J. *Practice in case of school children.* New York: Teachers College, 1913.

from those in reading, writing, spelling, and arithmetic. There is great need for study of learning processes in each school subject under school conditions, using standardized tests as instruments of analysis. Such tests have furnished a valuable means of

TABLE II. INDIVIDUAL DIFFERENCES IN ADDITION, SUBTRACTION, AND MULTIPLICATION COMBINED. GRADE IV

Scores = Sum of Rights in Courtis Standard Research Tests in Arithmetic, Series B

Pupil	S	O	N	D	J	F	M	A	M	Gross Gain
1	13	15	13	18		23	31	35	38	25
2	1	6	9	18	17	14	31	34	37	36
3	13	16	15	25	22	20	31	41	32	19
4	11	8	10	19	21		23	34	31	20
5	5	6	12	16	18	18	25	29	28	23
Av. Group I	8.6	10.2	11.8	19.2	19.5	18.8	28.2	34.6	33.2	24.6
6	2	5	12	11	11	12	21	20	28	26
7	4	4	11	15	15	12	20	28	24	20
8	4	5	8	7	12	12	25	26	23	19
9	9	7	14	15	13	15	20	23	22	13
10	5	3	9	10	14	14	18	21	20	15
Av. Group II	4.8	4.8	10.8	11.6	13.0	13.0	20.8	23.6	23.4	18.6
11	9	13	12	17	13	8	21	22	18	9
12	7	7	6	8	5	7	16	16	17	10
13	3	6	3	7	8	5	14	19	17	14
14	1	2	4	8	10	9	14	21	17	16
15	6	10	5	7		12	18	6	16	10
Av. Group III	5.2	7.4	6.0	9.4	9.0	8.2	16.6	16.8	17.0	11.8
16	0	0	3	4	12	7	10	13	16	16
17	0	4	5	6	2	10	5	8	10	10
18	0	7	5	4	9	6		11	9	9
19	3	2		11	12	4	9		9	6
20	4	3	2	0	4	0	0	11	6	2
Av. Group IV	1.4	3.2	3.8	5.0	7.4	5.4	6.0	10.8	10.0	8.6
Class Averages	5.0	6.4	8.3	11.3	12.1	10.9	18.5	22.0	20.9	15.9

diagnosis, but progress in therapeutics has not kept pace with progress in diagnosis.

4. *Individual differences in amount and rate of improvement.*—To what are the great gains with practice due? Are they due to a uniform gain by all pupils, are they due to very great gains by the better pupils, or are they due to large gains by the poorer pupils? Do the initial individual differences tend to increase or decrease throughout the year? The few studies that have been made have shown marked differences in improvement and, moreover, they have shown that individual differences tend to increase rather than to decrease with equal amounts of practice.[3] The data in this study point unmistakably to the same conclusion. A

TABLE III. INDIVIDUAL DIFFERENCES IN FOUR FUNDAMENTAL OPERATIONS. GRADE V

Scores = Sum of Rights in Courtis Standard Research Tests in Arithmetic, Series B

Pupil	S	O	N	D	J	F	M	A	M	Gross Gain
1	9	12	21	36	36	47	64	65	64	55
2	28	25	31	39	40	44	50	63	63	35
3	8	20	20	17	19	28	47	69	63	55
4	18	20	31	34	30	39	47	43	56	38
Av. Group I	15.8	18.8	25.8	31.5	31.2	39.5	52.0	60.0	61.5	45.7
5	17	17	33	33	33	48	56	62	51	34
6	11	11	22	22	23	27	33	46	44	33
7	19	16	29	34	20	38	40	42	42	23
8	6	5	21	21	17	20	31	53	41	35
Av. Group II	13.3	12.3	26.3	27.5	23.3	33.3	40.0	50.8	44.5	31.2
9	18	16	21		23	28	38	52	39	21
10	8	17	20	22	25	20	31	37	38	30
11	13	14	15	19		25	30		33	20
12	7	7	11	11	18	11	22	19	20	13
Av. Group III	11.5	13.5	16.8	17.3	22.0	21.0	30.3	36.0	32.5	21.0
Class Average	13.5	15.0	22.9	26.2	25.8	31.3	40.7	50.1	46.2	32.7

[3] Thorndike, E. L., *Educational psychology, briefer course.* New York: Teachers College, 1914. pp. 390-94.

special study was made of individual differences in arithmetic in the fourth, fifth, and sixth grades. For this purpose a single score for each pupil was secured by adding together the number of examples right in each of the four fundamental operations. In the fourth grade the score is the sum of the rights in addition, subtraction, and multiplication, as the work in division was not begun until December. The twenty pupils of the fourth grade were divided into quartiles on the basis of the May score. The pupils of the fifth and sixth grade into tertiles.

Tables II–IV give the individual group and class scores for each month and the gross gains through the year.

TABLE IV. INDIVIDUAL DIFFERENCES IN FOUR FUNDAMENTAL OPERATIONS. GRADE VI

Scores = Sum of Rights in Courtis Standard Research Tests in Arithmetic, Series B

Pupil	S	O	N	D	J	F	M	A	M	Gross Gain
1	28	38	48	56	50	57	69	66	79	51
2	30	30	38	45	42	48	61	67	62	32
3	21	20	36	28		38	51	65	61	40
4	21	19	31	24	33	35	43	56	61	40
5	23	21	29	27	30	35	46	53	52	29
Av. Group I	24.6	25.6	36.4	36.0	38.8	42.6	54.0	61.4	63.0	38.4
6	34	40	49	32	36	34	50	58	49	15
7	16	19	36	34	33	36	48	48	45	29
8		20	28	30	28	30	41	45	42	22
9	14	21	23	27	27	27	43	35	39	25
10	9	6	16	12	21	19	27	37	39	30
Av. Group II	18.3	21.2	30.3	27.0	29.0	29.2	41.8	44.6	42.8	24.2
11	8	15	13	12		21	35	36	38	30
12		16	18	18	24	30	34	35	37	21
13	12	10	17	12		16	30	28	35	23
14	17	24	30	24	26		25	28	30	13
15		13	20	12	22	17	27	31	23	10
Av. Group III	12.3	19.5	19.6	15.6	24.0	21.0	30.2	31.6	32.6	19.2
Class Average	19.4	20.8	28.8	26.2	31.0	31.5	42.0	45.9	46.1	26.7

The problem of measuring accurately the amount of improvement with practice, and especially the comparison of individuals with varying initial and final efficiency scores in amount and rate of gain, is beset with difficulties, as has been frequently pointed out.[4] While it is therefore impossible to state adequately or definitely the amounts and rates of gain by either a gross gain or a percentile method, an inspection of the tables shows that by any rational method of interpretation the scriptural law "to him that hath shall be given" holds. Those with the highest initial scores have the highest final scores and gain most both absolutely and relatively. This is perhaps best indicated by expressing the scores in terms of deviations from the averages. Tables Va–Vc inclusive give these facts for the three grades.

TABLE Va. GROUP DEVIATIONS FROM CLASS AVERAGES. GRADE IV

	S	O	N	D	J	F	M	A	M
Group I	+3.6	+3.8	+3.5	+8.9	+7.4	+7.9	+9.7	+12.6	+12.3
" II	−0.2	−1.6	+2.5	+0.3	+1.1	+2.1	+2.3	+1.6	+2.3
" III	+0.2	+1.0	−1.7	−1.9	−3.1	−2.7	−1.9	−5.2	−3.9
" IV	−3.6	−3.2	−4.5	−6.3	−4.7	−5.5	−12.5	−11.2	−10.9

TABLE Vb. GROUP DEVIATIONS FROM CLASS AVERAGES. GRADE V

	S	O	N	D	J	F	M	A	M
Group I	+2.3	+3.8	+2.9	+5.3	+5.4	+8.2	+11.3	+9.9	+15.3
" II	−0.2	−2.7	+3.4	+1.3	−2.5	+2.0	−0.7	+0.7	−1.7
" III	−2.0	−1.5	−6.1	−8.9	−3.8	−10.3	−10.4	−14.1	−13.7

TABLE Vc. GROUP DEVIATIONS FROM CLASS AVERAGES. GRADE VI

	S	O	N	D	J	F	M	A	M
Group I	+5.2	+4.8	+7.6	+9.8	+7.8	+11.1	+12.0	+15.5	+16.9
" II	−1.1	+0.4	+1.6	+0.8	−0.2	−2.3	−0.2	−1.5	−3.3
" III	−7.1	−1.3	−9.2	−10.6	−7.0	−10.5	−11.8	−14.3	−13.3

[4] Thorndike, E. L., *Psychology of learning*, 1913, pp. 165-77.

It is apparent that Group I in each case deviates farther and farther above the average with each succeeding month, while Group IV in the fourth and Groups III in the fifth and sixth grades drop farther and farther below the average. The highest group progresses with a marked positive acceleration, while the lowest group progresses with equally marked negative acceleration in relation to the class average. The result is that while Group IV in the fourth grade attains the standard score of the grade, Group I with an initial score of the fourth grade in June attains almost that of a standard eighth grade. The range of variation in progress in the fifth and sixth grades is similarly great—far beyond the range of standards published.

This study is but a beginning in an important problem, *viz.*, to record more accurately than we have hitherto the progress of children through the school year. Progress is determined by a great number of factors and conditions, all of which need to be carefully studied. The great effect of placing work under experimental conditions as a stimulus to interest and effort is amply demonstrated. Its value for supervisory purposes in diagnosis and classification is equally clear.

IMPROVEMENT OF INSTRUCTION THROUGH THE USE OF EDUCATIONAL TESTS

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A few years ago in conversation with the superintendent of schools in a city of about forty thousand population, I inquired concerning the use he was making of educational tests; he replied that he was using tests, that in fact, he made it a point to give each new test to a few hundred pupils. He then made a very significant statement. He said that he had given the Courtis arithmetic tests the year before, and that his teachers had failed to find the pupils doing any better in arithmetic after the tests were given than they did before.

Unfortunately, this incident represents the attitude of a considerable number of users of standardized tests. They consider such tests as teaching devices, and express dissatisfaction with them when they do not cause pupils to do better school work. Others have thought of educational tests as playthings which they might use for their own entertainment or for the entertainment of audiences at teachers' meetings. Beautiful charts in colored inks have been constructed to represent the scores obtained; and because such charts are new and tangible, they have attracted much attention.

Educational tests are not playthings; neither are they teaching devices. It is not their function to increase the abilities of pupils. They are designed to yield information in the form of measures of the abilities of pupils. Only as this information is interpreted in terms of pupil needs and these are in turn used as a basis in planning future instruction, will the use of tests increase abilities.

In the past the major use of educational tests has been by superintendents and principals. Their purpose has been to ascertain how the pupils of their schools stood in comparison with pupils in corresponding grades of other schools or with reference to standard scores. In some cases the tests have been used as a

basis for judging the efficiency of teachers. These uses are important and in the last analysis have as their function the improvement of instruction. Educational tests, however, may be used and indeed ought to be used directly by teachers as instruments for making more effective their efforts as instructors. We now have sufficient scientific evidence to show that the measurement of the abilities of pupils at appropriate intervals and the use of this information in planning future teaching will increase the abilities of the pupils. Hence, it is important that teachers learn how to use standardized tests to improve instruction.

Giving these tests, marking the papers, and tabulating the scores are only first steps. In many instances beneficial results have followed when the work has not been carried beyond this stage. The attention of both pupils and teachers may thus have been directed to the minimum essentials of the school subject. They may have been given a more definite aim and a stronger motive. But, in order to reap the full benefit, the scores obtained from giving a test must be interpreted in terms of pupil needs; and then the instruction must be modified in accordance with the interpretation. This article is, therefore, written to suggest a method of interpreting the scores of a group of pupils.

Interpretation in terms of pupil needs involves more than simply ascertaining that the class median is above, up to, or below standard or that certain pupils are above, up to, or below standard. Doing this is equivalent to a physician's telling his patient that his temperature is 103, that his liver is not functioning properly, that he has serious indigestion, and that he is threatened with a nervous breakdown. Clearly this is insufficient. If the physician is to be of service to his patient, he must interpret these facts in terms of his patient's needs. Then in accordance with these needs, the physician must prescribe for him—for example, tell him to eat no meat or starchy foods, to spend several hours out of doors each day, and to take certain medicines before each meal and at bedtime.

In interpreting scores of educational tests in terms of pupil needs, it is necessary to make similar prescriptions of changes in instruction. The scores of the pupils and of the class, together with the errors, correspond to the temperature, pulse rate, condition of tongue, location of pain, etc., of a patient. They are

the *symptoms;* and it is their meanings which are of real importance. Besides saying that the median of a certain sixth grade class in silent reading is below the standard for the fifth grade and that 25 percent of the pupils are below standard for the fourth grade, while only 18 percent are up to or above standard, we should add that as a whole the class needs to give less attention to oral reading, that it needs to devote a practice period of 30 minutes a day to the silent reading of simple descriptive prose, and that certain specified pupils need to give special attention to acquiring the meaning of words. An interpretation may also include a statement that certain pupils who made very high scores ought to be promoted to the next grade, or that they need not continue to study silent reading, but that they should spend the time thus saved in the study of arithmetic.

Different classes as a whole have different needs, and the individual members of a class have a great variety of pupil needs. The first step, however, in interpreting the scores of a class is to ascertain the needs that are common to the class as a whole or to large groups within the class. This should be followed by an individual interpretation of the scores of those pupils at the extremes of the group, particularly of those conspicuously below standard. At present, we do not have sufficient scientific information to permit us to formulate complete statements of the pupil needs which are indicated by the various combinations of symptoms. In the absence of such formulations, it will be helpful to outline a general procedure which may be followed in interpreting the scores of a class after they have been tabulated on the class record sheet. In order that the subject may be as concrete as possible, it will be stated in terms of the Courtis Standard Research Tests, Series B. However, one can easily adapt the general plan to any other test.

In a rough way we may group the great variety of combinations of scores of classes under six cases as follows:

Case 1. Class medians below standard in both rate and accuracy.

Case 2. Class medians for rate below standard with satisfactory or high accuracy medians.

Case 3. Class medians for accuracy below standard with satisfactory or high rate medians.

Case 4. Scores of members of the class widely scattered.

Case 5. Irregular development; class medians in one test up to or above standard with class medians in another test distinctly below standard.

Case 6. Class medians for both rate and accuracy up to or above standard with the individual scores grouped closely about the medians.

Any particular class may exhibit certain combinations of these conditions. For example, the median rate in a test (i.e., addition) may be below standard with a satisfactory or high accuracy median and at the same time the scores of the members of the class may be widely scattered. Such a class would be considered as coming under both Case 2 and Case 4.

For each of these cases, it is possible to list certain probable needs. All of these needs may not apply to a given class but some of them will almost certainly be appropriate. In general, it will be profitable to investigate these needs first and determine which of them apply to the class in question. The most probable needs for each case are given below.

Case 1.—This is probably a case of inefficient teaching. It is true, there may be some other explanation of the low median scores and it is well of course to investigate this possibility. For example, it may be suspected that pupils are below normal in general ability, and evidence on this question may be obtained by giving a test of general intelligence. Or, scores may be below standard because of an unusual course of study, and a comparison of the particular course with a number of successful courses may be made. Still other causes may be responsible to a greater or less extent for the condition; but inefficient teaching is the most probable single cause.

Instruction may be inefficient with respect to drill. Perhaps more time should be devoted to it, but it is more likely that the time already devoted to it should be used more effectively. Drill work ought to be organized so that every minute is used by every pupil. Many teachers waste time by allowing some pupils to be idle while others are occupied. When pupils are working examples at the board, some teachers dictate one example at a time and do not stop the work until the slowest pupil has finished. The result is that pupils who work rapidly are idle a large part of the time. It is easy to carry on drill work in such a way that loss of this kind will not occur. In the case just mentioned the

amount of time wasted will be greatly reduced if several examples instead of one are dictated at a time and the work stopped as soon as the most rapid workers have finished. Some teachers also waste time in having purely mechanical work explained when the pupils need drill rather than explanation. Again, drill may be inefficient because of the failure of the teacher to recognize *rate* of work as important. The need may be increased motivation. If this is the case, the teacher will find educational tests themselves helpful. In addition he can make use of a variety of devices for securing a stronger motive, including the assignment of work under timed conditions.

Case 2.—The most probable need of a class which is below standard in rate with satisfactory accuracy is for *speed drills*. In other words, it is likely that the teacher has not been placing sufficient emphasis upon the rate of work. A possible need is for the elimination of time-consuming methods of work, such as the use of an elaborate phraseology in performing the operations. For example, pupils may be required to name each successive digit in adding a column of figures instead of naming only the partial sums. In some cases slow work is due to the failure of pupils to concentrate attention upon the task. Under such circumstances they should be trained in giving continuous and undivided attention to the task assigned. This includes, among other things, the need for securing a stronger motive.

Case 3.—A low median score in accuracy may be due to the fact that, in working under the timed conditions of the test, the pupils become excited and that in attempting to do a large number of examples they become careless. When this happens, the test should be repeated; and it is likely that on the second trial, the median for accuracy will be much higher. If, however, the condition persists, the pupils should have frequent timed drills under the conditions of the test and should thus learn to assume the proper attitude toward the test. It may be that the need is even more fundamental. There are many different types of examples in a given operation—e.g., in addition. Pupils may have learned to do some types without having learned to do others. For example, they may be able to add short columns without being able to add long columns because of the increased span of attention required. It may be that the pupils have never been given instruction upon the particular type of example

occurring in the test. If so, they need to be taught how to do this type.

Case 4.—When the scores of the several members of the class are too widely scattered, the probable need is for individual instruction. The form of this instruction will depend upon the particular needs of the individual pupils. An analysis of the performance of a pupil is required in order to know his particular needs; but in general, the probable needs of individual pupils are the same as the probable needs of a class. The conditions occurring in Case 4 may often be met by promoting certain pupils to a higher grade and demoting others to a lower grade, provided the general organization of the school will permit such action. When this cannot be done, the teacher must devise some way to give to each pupil that instruction which will meet his needs. Practice exercises such as the Courtis Standard Practice Tests[1] have been designed to assist in meeting individual needs.

Case 5.—Irregular development is made possible by the fact that there are a number of different types of examples. Pupils may and do learn to do certain types without learning to do other types with anything like the same rate and accuracy. When irregular development is found to exist, the need is for a redistribtution of emphasis in the instruction. Clearly, types for which the scores are low need to be given more emphasis while those for which the scores are up to or above standard need less attention. The Courtis Standard Research Tests, Series B, can only show irregularities between the four fundamental operations. A series of diagnostic tests will reveal irregularities between different types of examples within the same operation.

Case 6.—When a class is above standard in all respects it may be thought that conditions are satisfactory and that the pupils have no needs. This, however, may not be true. Among the most probable needs are (1) promotion to the next grade, (2) less time to this subject and more to others, (3) opportunity to take up more advanced topics. The meeting of these needs (especially

[1] The Courtis Standard Practice Tests in Arithmetic (published by the World Book Company, Yonkers-on-Hudson, New York) are practice tests in the four fundamental operations with whole numbers. The complete set consists of cabinet 1 (a set of 720 lesson cards for a class of fifty pupils), cabinet 2 (a set of 288 lesson cards for a class of twenty), a student's record and practice pad, a teacher's manual, and a teacher's record. A specimen set may be obtained from the publishers for a dollar.

the one involving promotion to the next grade) depends on the general plan of organization of the school. When a class is just up to standard, pupils may need a continuation of the present instruction or they may now be ready to go on to something else.

Locating a class under one of these cases and ascertaining which of the suggested probable needs apply are the first steps in interpretation. With the partial exception of Case 4 (irregular distribution of scores), it is mass interpretation and for that reason it is necessarily crude. Like mass instruction, it will not fit all pupils. While the members of the class probably have some common needs, there are also likely to be many individual needs. Thus such mass interpretation should be supplemented by an interpretation of the scores of individual pupils, especially of those having the highest and lowest scores.

In both class interpretation and individual interpretation, it is necessary to remember that the teacher has access not only to the scores but also to the test papers which give the performances of the pupils in detail. An analysis of these is helpful, especially where there is any uncertainty about the needs of the pupils. A score reveals nothing as to what was lacking in the mental processes of the pupil, but an analysis of his errors may reveal the defect and suggest corrective instruction. In making this analysis, it will be helpful to classify the errors which the pupil has made. In multiplication, the error may be one of multiplication, of placing the partial products, or of addition. In addition, and to a less extent in the other operations, it is frequently impossible to determine the nature of the error. In such cases, one should observe the pupil as he works or even have him "express orally his mental processes." Whenever such detailed studies of the performances of pupils have been made, significant facts have been revealed. This kind of study requires much time, but the time is profitably employed.

Although interpretation cannot be reduced to a mechanical basis, it is believed that the general procedure just outlined will be helpful as a beginning and will lead naturally to the individual analyses without which accurate individual adjustments cannot be made. The fundamental thing for the teacher to bear in mind is the principle that only when we interpret the scores of a test in terms of pupil needs and modify instruction to meet those needs will educational tests fulfill their function.

VALUE OF INFORMAL TESTS OF READING ACCOMPLISHMENT

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Informal tests, as the term is used in this discussion, relate to tests which are organized by the classroom teacher or supervisor for the purpose of securing accurate records concerning the accomplishments of pupils. They differ from standardized tests in that they are not so carefully organized, they have not been given to a large number of pupils under similar conditions, and there are no standards which can be used as a basis for comparison. It is evident at once that such tests have serious limitations as contrasted with the more elaborate types of standardized tests. In recommending their use in this discussion it is not intended to urge that they take the place of standardized tests. It is intended on the other hand to show that informal tests must be used frequently along with standardized tests, if testing is to be continuous and most effective.

Directions for an informal test of oral reading follow in order to illustrate the character of such tests:

"*Measuring the rate of oral reading.*—The simplest measurement under the ordinary conditions of class work is probably a measurement of the rate of oral reading. This record can be secured in any ordinary reading exercise as follows: Choose for this exercise one or more selections which the pupils read early in the year. Set aside a reading period for a great deal of oral reading. Make no previous assignment. The pupils should read as in ordinary reading lessons without suspecting that their speed of reading is being recorded. Have at hand a sufficient quantity of reading material so that no two pupils read the same paragraphs.

"The teacher will need a reader which can be marked freely with a pencil; also a watch with a second hand. When a pupil begins reading, note the exact second at which he reads the first word of the selection. Follow the watch carefully, and when

exactly sixty seconds have passed, check the word which the pupil was reading when the minute was up. Let the pupil continue reading without interruption to the end of the paragraph as he would in any reading exercise. Make whatever comments or ask whatever questions would be asked in an ordinary reading lesson and then go on to the next pupil. If, during the reading, a pupil hesitates a few seconds because of a difficult word, pronounce the word for him so that he may continue reading.

"Be sure that you mark the following points for each member of the class: (a) the particular part read by each pupil; (b) the point at which he began reading; (c) the point which had been reached at the end of sixty seconds. At your earliest convenience count the number of words read by each pupil during the minute. Count "a" and "the" and other short words, each as one word. Record the total number opposite the pupil's name on a record sheet which you will keep for your own use. Do not destroy these records. Keep them on file. They will be valuable for purposes of future comparison.

"This type of exercise should be continued for two or three class periods. Usually a teacher who tries to give tests and record facts for the first time finds that she is distracted and inaccurate. Confidence and skill develop very rapidly, however, with practice. Continue the measurements of the rate of oral reading until you feel confident that you can secure the records accurately."

There are three lines of argument which can be advanced in favor of informal tests. In the first place, the number of standardized tests in reading is limited. At most there are not more than ten which have been carefully standardized. Although these tests measure the accomplishments of pupils in several phases of reading ability they do not include, by any means, all of the significant phases. Until a more inclusive set of reading tests has been developed, teachers and supervisors will have to organize informal tests for their own use, if detailed studies of all phases of reading are made. Furthermore, only a limited number of tests appear in duplicate or triplicate form. Hence only a few standardized tests which are comparable in difficulty can be given at different times during the year. It is evident, therefore, that if teachers and supervisors carry on investigations of reading con-

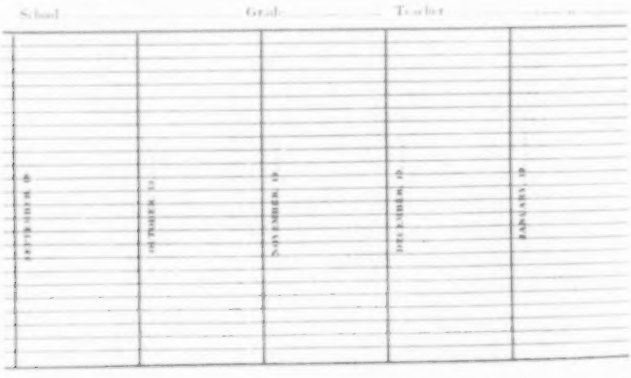
tinuously, informal tests must be used at frequent intervals to supplement the more detailed studies made through the use of standardized tests. Unless investigations proceed regularly and systematically throughout the year, it is probable that tests will be interpreted as a novelty. Under these conditions they fail to enlist the constructive effort of teachers for any significant period of time.

In the second place, the wide use of informal tests brings to the teacher's attention accurate data on which to base judgments concerning the needs of pupils. Teachers have been justly criticized in the past because they have proceeded with their work too largely on the basis of opinion. Standardized tests have changed the situation somewhat because their use involves detailed analysis, accurate measuring, careful recording, and judgments on the basis of facts. In order to provide teachers with the necessary means of securing accurate data whenever problems arise, it is necessary that informal tests be employed more largely than in the past as a part of the regular routine of instruction. The most significant value which comes from the continuous use of standardized and informal tests is the new interest in teaching which is stimulated, and the spirit of investigation which is developed. The teacher who scrutinizes her work carefully and records accurately, becomes more openminded, more interested in adequate proofs, and less willing to follow the line of least resistance by accepting blindly all things on authority. These results cannot be secured through the occasional use of standardized tests. They develop gradually as one makes continuous use of recording devices in careful studies of classroom problems.

In the third place, informal tests are given most frequently under normal classroom conditions. This is distinctly to their advantage because measurements are of most significance when they are secured in a normal recitation. It is frequently assumed that when recording devices are used regular instruction stops. This view has its origin in the fact that standardized tests are frequently given under somewhat unusual conditions. The fact is emphasized at this point, however, that a recording device is good only to the extent that it fits into the regular work of the class and at the same time gives a series of accurate results.

Measurements are of greatest value when they bring out the normal facts which are always present but which are not recorded for the most part in reading exercises. When asked to secure records, teachers should be sure first of all that the process of measuring does not change materially the character of regular classroom instruction. A normal lesson should be planned out in which the pupils get as much instruction as though no recording of facts was going on. It is because informal tests fit into such a program of measurement and instruction that their wide use is most heartily urged at this point.

Supervisors who plan to pursue investigations of reading in which informal or standardized tests are used should not overlook the fact that teachers need training in securing records. This is a new type of classroom technic in which teachers should be instructed just the same as when a new system of handwriting is introduced. Many supervisors create opposition to tests by imposing numerous requirements on teachers before they are adequately trained to secure records or to understand their significance. The approach to the measurement idea which was made by Superintendent T. W. Callahan of Galesburg, Illinois, is significant in this connection. He first organized instructions for simple informal tests of the rate of oral reading. According to his plan, the teachers were to secure records once each month during the year 1918–1919. The following form was used as a record blank on which to show the results of the tests. By using both sides of the card, spaces were provided for each month of the school year. The reverse of the card is exactly like the face except that the months are different.



Each pupil was designated by a letter of the alphabet. Entries were made on the card according to the following directions. The directions assume that the card is before the teacher turned at an angle of 90 degrees to the right from its present position.

"In scoring on the card, number the spaces from left to right to indicate the number of lines read per minute. Then for example, suppose, pupil C reads 9 lines and makes 4 mistakes. In the space numbered 9 place the letter C with a small figure 4 at the lower right-hand corner of the letter."

As the tests continued throughout the year, the teachers became more and more familiar with the methods of recording. The significance of the measurements was emphasized with each successive test. When the tabulations for the year were complete, the teachers were able to see what progress had been made by the class as a whole and by individual pupils. The requirements were simple and easily fulfilled. One of the most frequent and significant outcomes of a series of informal tests of this type is that teachers develop an interest in objective records of the results of reading instruction. It is unnecessary to add that this is one of the important results which an expert supervisor will seek to secure. It paves the way for more intensive and intelligent studies of reading, and for keener interest in the continuous use of recording devices.

Karl D. Waldo, while superintendent of the Sycamore Public Schools, organized and conducted classroom tests of reading which illustrate in detail the type of work which should be carried on regularly in each classroom. In stating the reasons for his investigation Mr. Waldo said: "As supervisor I naturally watched the reading as it developed through the phonic method and compared it with the work done under the word plan and also with the reading of the higher grades which had started their reading with no regular system. With notebook in hand, I endeavored to keep a record of the individual work of the three systems for the purpose of comparison. These records were not very satisfactory and were based on oral reading only, with no attempt to determine the comprehension by the children of the passages read, other than that which could be shown by the oral expression."[1]

[1] Waldo, Karl D. "Tests in reading in Sycamore schools," *Elementary School Journal*, 15: 251-2, January, 1915.

"When I saw how inadequate the comparison made in this way proved to be, I looked for some better method of making a record of the work. The attempts of Ayres, Courtis, Thorndike, and others to formulate standard tests suggested the formation of a plan for more scientific testing of the reading work. I also wished to test the silent rather than the oral reading, for the former is of much greater importance, not only later in school, but in future life."

Informal tests were accordingly organized by Superintendent Waldo which were simple, which closely resembled the regular work of the school, and which could be given in about an hour. The material selected for the test was in the first issue of *Current Events*, a school paper, for the year 1913–1914. The papers were passed out and the pupils were asked to proceed, when the signal to begin was given, as they would in reading any newspaper article in which they might be interested. Five minutes were allowed for the reading. When the signal to stop was given each pupil checked the last word read and wrote his name on the paper. The pupils were then asked to write a complete account of what they had read and to answer ten questions, covering the subject-matter read. The accomplishment of each pupil was then expressed in terms of his rate of reading, the percentage of the words reproduced, and a percentage grade for questions answered correctly.

The same procedure was used in all grades except that the third and fourth grades had different material and read a story of Daniel Boone in Eggleston's *Stories of Great Americans for Little Americans*. The first test was given early in the school year. After six months a second test was given in the same manner and with selections of corresponding difficulty. Check tests were given to determine the relative difficulty of the passage. The results, when tabulated, revealed three important facts[3] concerning the reading in Sycamore.

1. "Great variation exists in reading ability between different individuals in the same grade, and many children in lower grades are much better readers than the average of the upper grades. . . . .

[3] *Ibid.*, p. 267.

2. "In careful reading the rate increases but slowly in school work after the fifth grade. The increase in comprehension, however, is regular from the lower to the upper grades.

3. "The third and fourth grades are places with the possibilities for wonderful development, especially in the mechanics of reading. The effects of starting the reading with a phonic system like the Ward are not evident in the reading of the upper grades. Tests tend to stimulate the work in reading, but have more effect upon the reading rate than upon the ability to comprehend what is read."

The value of such tests as an aid in supervision was summarized by Waldo as follows:[3]

> These statements show that as a means of supervision and administration, tests like this one are of much utility. Some teachers may doubt the value of the superintendent's criticism or may feel that his opinion of the work in their rooms is unwarranted. After such a test there is no need for the superintendent to criticize. The facts found in this test were shown in the bimonthly teachers' meeting and, after discussion, were accepted by the teachers as indicative of the true situation in the reading work. Knowing the situation is the first step in the direction of effective work, and after that is taken both teachers and superintendent can, in cordial co-operation, set about improving the reading work.

The use of informal tests is not limited to elementary school classes. With increasing frequency reports are published dealing with the use of such tests in high school classes. Miss Bertha M. Smith recently reported[4] the results of an investigation which she made in freshman classes of the high school on efficiency in assimilating reading. The passages chosen for the test related to Dickens and were taken from Long's *English Literature*. After the pupils had read intensively for five minutes they were asked to reproduce what they had read. The comprehension scores were determined in terms of the percentage of the total number of ideas which were reproduced. These records enabled Miss Smith to study the number and types of errors made by different pupils. The tests showed that those who do well in their regular school work do well in reading tests, and that those who do poorly in their daily work do poorly in the tests. The tabulated records

[3] *Ibid.*, p. 253.

[4] Smith, Bertha M. "Efficiency in assimilating reading," *School Review*, 25:637–45, November, 1917.

revealed the fact that both good and poor readers are ordinarily classified together and are assigned the same amount of work. In commenting on the injustice of this situation, Miss Smith said: "The teacher taking too much for granted has, no doubt, caused many a pupil to go beyond his depth. If tests were to be derived which would show what kind of mind the pupil has and, in some measure, its capabilities; then if courses were arranged in the curriculum that would take care of these variable types and would begin with them where their abilities begin, not so many pupils would complain, 'I'm not interested.' At present the good, the poor, the indifferent are grouped in the same classroom. Much of the instruction is below what the strong pupil needs, and much of it is above the weak pupil."

To remove similar difficulty the English department of the High School of the University of Chicago classifies its pupils into good, medium, and poor readers at the beginning of each year, by means of informal tests. Each group is then given assignments which are adapted to their capacities. Furthermore, the poorer sections are given training in the art of effective silent reading and study. From week to week, informal tests are given along those lines which have been selected for special attention.

Four illustrations have been given of the value of informal tests in improving instruction. Work of this type is already under way in many progressive schools. Many teachers and supervisors, however, have been somewhat slow in adopting both standardized and informal tests as essential devices for securing better results. Evidence goes to show that frequent informal tests are just as essential as books, blackboards, supplementary reading material, etc. They supply the teacher with the facts which are necessary in a scientific organization of her work from day to day.

In most cases a supervisory officer must serve as a progressive leader in stimulating this type of work. Illustrations of such studies must be presented to teachers. The value of these investigations must be emphasized. Directions for carrying on such work must be definitely outlined. Progressive teachers who are interested and who have ability to organize the work effectively must be selected for the first studies. The results of their studies should be presented to the teachers in order that they may see

more clearly the values to be derived from such studies and the methods to be employed. The supervisor must hold himself responsible for assembling scientific reports relating to the problems under consideration, and for their presentation and interpretation to the teaching staff. No opportunity should be lost to stimulate interest on the part of teachers in making detailed studies of their problems. It is because informal tests are proving of so much value in this connection that their use has been so heartily recommended in this article.

THE DEVELOPMENT OF THE UNIT PLAN OF PENMANSHIP PRACTICE

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The waste of time and energy in teaching muscular movement writing is probably greater than the waste in teaching any other subject of the public school curriculum.

This is due to several causes, among which is the custom of teaching penmanship according to grades rather than according to the needs of the children. In arithmetic for example, the lower grades represent elementary, the middle grades intermediate, and the upper grades advanced, instruction. When applied to muscular movement writing, however, the grade in which the child is working is often immaterial. It may impose upon him subject matter which is too difficult for him to practice with correct habits; and, as a result of this, his progress in writing may be retarded rather than accelerated by his practice.

The pupil who does not know how to sit, how to hold his pen and how to use the correct movement, is a beginner in muscular movement writing, regardless of the grade in which he is working; and the only way for him to advance is to practice the elementary principles until his incorrect habits have given place to correct habits.

Too often the retardation of a child in writing is attributed to lack of interest, to absence of natural talent, or to causes other than the real one. Frequently the cause of failure is not in the child himself, but in the course of instruction which does not provide him with the kind of subject matter adapted to his particular stage of progress.

A few years after the introduction of the muscular movement into the St. Louis Public Schools, we discovered that the percentage of good writers among our eighth grade pupils was below what we desired, and that considering the time spent in practice, the results were not as good as we had reason to expect.

When muscular movement was adopted, the pupils of all grades were on the same plane as far as skill in this method of

writing was concerned: but with the continued use of the plan some of the children showed more interest in the writing than others, some showed greater skill, and to others the subject matter of the lessons was better adapted. Added to this was the steady influx into all grades of outside pupils, some of whom had not had the same training as our own pupils. The result was that, at the end of three or four years, there were in every room above the third grade three distinct groups of writers—the good, the mediocre, and the poor.

The first group was composed of pupils who wrote well in both writing practice and in daily work; the second group wrote ovals and easy capitals, but could not apply correct habits to the writing of difficult subject matter, or to daily writing; and the third could not even make ovals with correct position and movement.

We found that the needs of these three types of pupils, grouped together as a class, were as varied as would be the needs of a class of pupils in arithmetic, some of whom had advanced as far as subtraction, others as far as fractions, and still others as far as percentage.

I frequently invited the principal of the school to witness with me this adverse condition under which the teachers and pupils were working.

We found that where the teacher was adapting her instruction to the needs of the elementary pupils of her class, the intermediate and advanced pupils were wasting their time by needless review; that where she was working with the mediocre writers, the subject matter was too easy for the advanced writers and too difficult for the elementary writers; and that where she presented subject matter adapted to the needs of the advanced pupils, the mediocre pupils and the elementary pupils not only failed to derive benefit from the practice, but were actually accentuating their errors and establishing bad, rather than good habits.

Our first step toward correcting this unfavorable and discouraging condition was to organize in accordance with their needs in penmanship, three groups of writers in every room, known as the A, the B, and the C pupils. The pupils changed their seats for writing practice and each group received instruc-

tion on separate days while the other two groups studied other subjects. While this was in some respects an improvement over the former plan, it was very unsatisfactory because of loss of writing practice time for the pupils who were using the writing hour as a study period, and it was therefore abandoned.

Inasmuch as each teacher had elementary, mediocre, and advanced pupils in her room, it was decided to form three adjacent rooms into a *unit*, arrange the programs so that the writing hour of the three rooms would come at the same time, and have all the elementary pupils of the unit go to one room, the mediocre pupils to another, and the advanced pupils to another. This was done as an experiment, and the advantages of the new plan were evidenced at once by greater interest on the part of both teachers and pupils, and in the very marked improvement in the writing of the pupils of each group of the unit.

Then the promotion feature suggested itself and a definite time once a month was named for the promotion of the best writers (up to ten) of each group of the unit. The best writers of the highest group when promoted were seated in the lowest room of the unit and allowed to use the writing period for the study of other subjects, or for story reading. Some even served as demonstrators or "helpers" in the elementary group.

From this nucleus of a three-room unit, the unit plan has expanded until at present seventy of our schools have three-room or four-room units in grades from four to eight, inclusive, and other schools are adopting it as fast as the writing department can organize the work.

The three-room grouping in a twelve-room school is here used to illustrate the operation of the unit plan.

Rooms 1, 2, and 3, representing seventh and eighth grades, compose Unit 1. Rooms 4, 5, and 6, representing fifth and sixth grades, compose Unit 2. Rooms 7, 8, and 9, representing third and fourth grades compose Unit 3. The first and second grades are not included in the unit plan of practice.

Each unit is independent of the other units and the plan in all the units is the same as that here illustrated and described.

Figure 1 shows the seating at the time of organization. Class 2 is in Room 2; Class 3, in Room 3; Class 4, in Room 1. In classifying pupils Room 1 should be reserved for the poorest

writers and for those who by promotion may be advanced from Room 2 to the exemption class (Class 1). When possible it will be well to make the elementary class of Room 1 smaller than the other classes, so that the teacher may give individual aid to the pupils of this class. The reason for placing the lowest class in Room 1 at the beginning of the term is to permit this room to become the highest room at the end of the term. This condition will result from promotions. It is indicated in Figure 3.

FIGURE 1. THE SEATING OF PUPILS AT THE TIME OF ORGANIZATION.

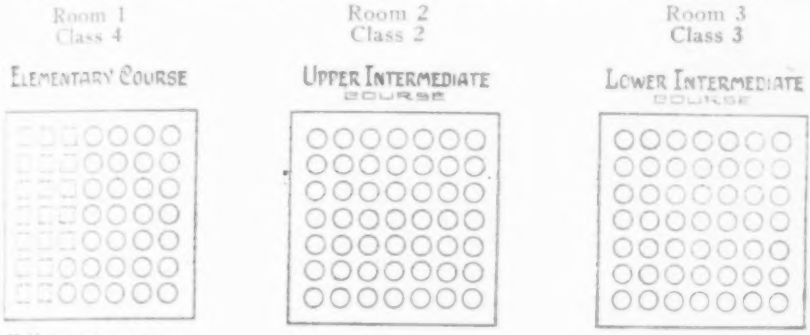


FIGURE 2. THE SEATING OF PUPILS AFTER THE FIRST PROMOTION.

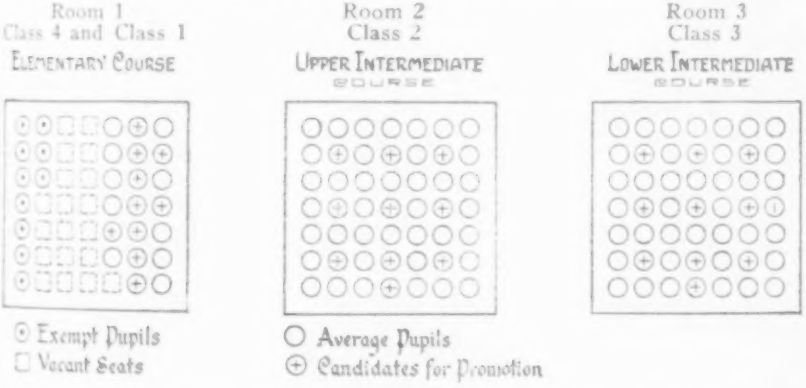


Figure 2 shows the seating after the first promotion. Ten pupils are here taken as an example of the number promoted from each room to the next higher room.

The exemption pupils, Class 1, seated on the left-hand side of Room 1, temporarily excused from penmanship practice, are permitted to use the writing time as a study period, or for supplementary reading. There is little probability that the writing of these pupils will deteriorate, because to remain in the Exemption Class, they must keep their daily writing up to a satisfactory standard.

FIGURE 3. THE SEATING OF PUPILS AFTER THEIR PROMOTION.

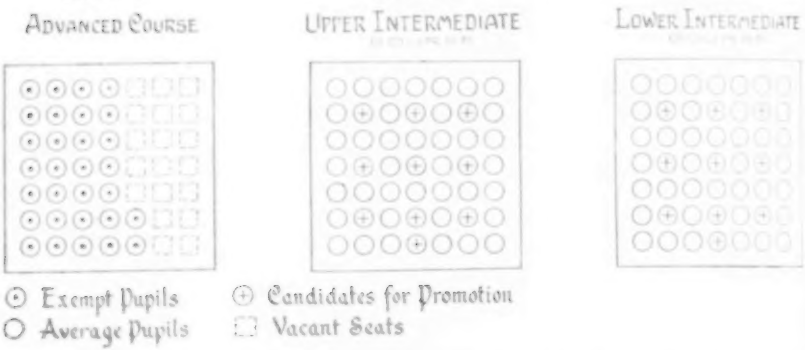


Figure 3 shows the rooms of the unit after the third promotion. The reader is to understand that a second promotion has advanced an additional ten pupils from each room to the next higher room and that now a third promotion advances a third group of ten pupils in a similar way. This makes thirty exempted pupils in Room 1 as shown in Figure 3. The elementary class (Class 4) has been eliminated and the pupils of the Exemption Class (Class 1) are ready to take up advanced penmanship practice. Now the best writers are in Room 1. Class 1 is now in Room 1; Class 2, in Room 2; Class 3, in Room 3. The rooms will retain this order until the end of the term.

The exempted pupils (Room 1, Class 1) are now ready to take up advanced practice. When the seats of Room 1 are filled, the Exemption Class is formed in Room 3. If this condition arises at all it will be found late in the school year, and the members of the Exemption Class may then be excused for the remainder of the term.

The condition existing after the exempted pupils in Room 1 have resumed practice and certain additional pupils of this room have been exempted and seated in Room 3 is shown in Figure 4.

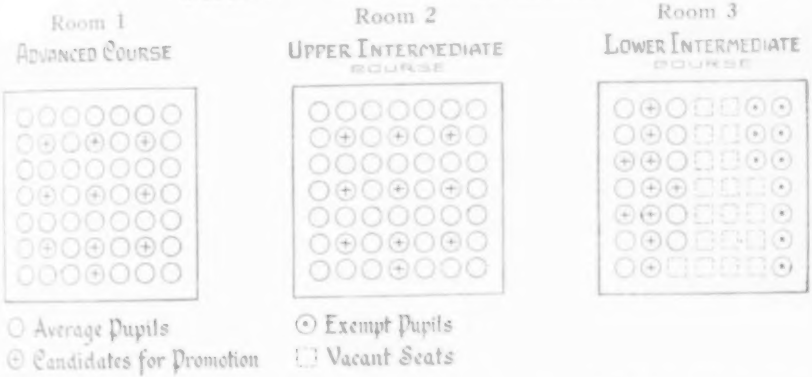
It will be seen that this plan precludes the possibility of congestion and that only those who can afford to do without the writing practice are exempted from it.

Owing to the varying sizes of desks, two-room units are suggested for buildings of eight rooms or less; three-room units for buildings of from nine to eighteen rooms; four-room units for buildings of eighteen rooms or more.

When possible the units should be formed so as to avoid making it necessary for the children to pass from one floor to another.

On a floor of five rooms, a three-room unit and a two-room unit may be organized, and on a floor of seven rooms, a four-room unit and a three-room unit may be formed.

FIGURE 4. FINAL PLAN OF SEATING



One of our principals has commented on the Unit Plan as follows:

The unit plan is advantageous because it gives the pupils who have not had sufficient elementary training in writing a chance to acquire this training, thus enabling them to strengthen their foundation, and with a stronger foundation to increase their ability to write.

The best writers, if intermingled with the poorer writers, are given so little attention that they often form incorrect habits which would have been avoided if more attention had been given them. The unit plan gives all pupils the same amount of supervision and allows them to undertake work which is on the level with their ability, thus encouraging both good and poor

pupils to put forth their utmost effort. It also stimulates interest in the poorer writers in that they work to obtain a place among the best writers, whereas formerly the poorer pupils lost this interest because they were discouraged when comparisons were made with the better writers of the class."

As a result of our experience with this new plan of practice, some interesting facts have come to light.

1. The percentage of "failures" is negligible.
2. The percentage of good writers among the boys is greatly increased and in many cases they equal or excel the girls in writing
3. The children are able to complete their formal practice much earlier in the course than formerly.
4. The supervision is greatly simplified. Formerly our writing department consisted of seven members; now it has three.
5. The teacher's problem of instruction is greatly simplified, and she is able to render not only more efficient aid to each pupil but to render it to a much larger number of pupils.
6. The penmanship is motivated without the aid of award certificates or prizes of any kind.
7. The principal's supervision of the writing is systematized. During the writing period of half an hour he may visit three rooms and find the pupils graded according to their skill in penmanship.
8. The unit plan admits of introducing into the advanced rooms of the unit composition and story writing in which the principles of correct writing may be made to function. This kind of practice furnishes the connecting link between formal writing practice and daily written work.

APPLICATION OF SCIENTIFIC METHOD IN EVALUATING THE SUBJECT MATTER OF SPELLERS*

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Within the last decade the dominant note in educational theory has been the social point of view—that the needs of society should furnish the end points of education and should serve as a basis for the selection of subject matter. This philosophy has been urged as applicable to all phases of educational activity and the insistence on its application has resulted in many recent investigations to determine scientifically the needs of society and the consequent subject matter. In no field have these investigations been more fruitful than in spelling and the educational theorist can look with great satisfaction upon the scientifically determined lists of most commonly used words representing the social need for spelling. But the realization of his hope has merely begun, for these scientifically determined lists of most commonly used words will have little influence until they have been incorporated into the spellers which are used throughout the length and breadth of this country, since the textbook has become such a dominant force in the life of the American teacher that it tends to determine the aims, the subject matter, and the method of instruction. The use of the properly constructed textbook then is the real answer to the theorist's demand for emphasis on the social point of view.

The present study was undertaken to show the possibility of evaluating the subject matter of spellers and of scientifically selecting a book having its vocabulary made up of the most commonly used words. It represents a comparison of the Anderson list of most commonly used words—a list containing 3,105 words used 5 or more times selected from the 361,184 running words which composed the contents of 3,723 business and social letters written by adults—and the vocabularies of five widely used

*The statistical tabulations utilized in this article were made by Frank S. Salisbury and the author is indebted to him for the privilege of using them in this article.

spellers: 1) *Champion Spelling Book*,[1] 2) *Peirce Spellers*,[2] 3) *Merrill Speller*,[3] 4) *Aldine Spellers*,[4] 5) *The Child's Own Spelling Book*.[5] The Anderson list[6] was selected because it represents the latest and most comprehensive of all the attempts to select the most commonly used words and includes a very large percent of the Ayres and Pryor lists. The first three spellers mentioned were selected because they are widely used in the state of Washington; the fourth one, because the preface indicates that the vocabulary researches have been utilized to a considerable extent in the word content of the book; the fifth one, because its subject matter stands as the direct product of a study of children's writing vocabularies. In making these comparisons, the subject matter of the different spellers was the only factor taken into consideration—no attention being given to physical features of the books, provisions for review, suggestions for teachers, suggested methods, gradation of words, or price. It is true that a complete survey of the books demands that all these factors be given due consideration but in the selection of a speller it is assumed that the spelling vocabulary is of primary importance.

In making the tabulations the words of the Anderson list were transcribed onto three by five inch cards—one word being placed on a card—and the cards were arranged alphabetically, indexed, and filed. Word by word, the vocabulary of each speller was checked with the words of the Anderson list. Records were made of the words common to a particular speller and to the list, of the words that were in the list but not in the particular speller, and of those words that were in the particular speller but not in the list. Hereafter reference will be made to these groups of

[1] Hicks, W. E. *Champion spelling book for public and private schools.* New York: American Book Co., 1909. 2 pts.

[2] Peirce, W. N. *Peirce spellers.* New York: Ginn & Co., 1912–13. 2 bks.

[3] Wilson, J. O. *Merrill speller.* New York. Charles E. Merrill, 1912. 2 bks.

[4] Bryce, C. T. and Sherman, F. J. *Aldine spellers.* New York: Newson & Co., 1916. 4 bks.

[5] Jones, W. F. *Child's own spelling book.* Pierre, S. D.: Capital Supply Co., 1915. 2 bks.

[6] Anderson, W. N. *The determination of a spelling vocabulary based upon written correspondence.* Master's dissertation, University of Iowa, 1917. This list is substantially reproduced in E. J. Ashbaugh's *Iowa spelling scale for grades II to VIII* (University of Iowa Extension Bulletin, no. 34-36, September 1—October 1, 1919).

words as "overlap" words, "list only" words, and "speller only" words.

Wherever a word in the list occurred more than once in a particular book the fact was noted and in estimating the amount of overlapping such a word was given but a single count. It was originally intended to record the repetitions for the "speller only" words, but since the primary interest of the study lay in the overlapping of the spellers with the Anderson list and since the repetition of the "speller only" words would have no bearing on the problem save on total number of words in the different books, the amount of repetition was estimated as existing in the same ratio as the repetition in "overlap" of the list and a particular

TABLE I. GROSS COMPARISONS OF THE FIVE SPELLERS WITH THE ANDERSON LIST

Spellers	Grades	Total Words in Book	"Speller Only" Words	"Overlap" Words	"List Only" Words	Percent of Book Represented by "Overlap"	Percent of Anderson List Included
1	2	3	4	5	6	7	8
Champion	3-8	6,270 (5,872)	4,846 (4,430)	1,424	1,681	22.7 (24.2)	45.9
Peirce	3-8	2,991 (2,862)	2,207 (2,078)	784	2,321	26.2 (27.0)	25.2
Merrill	3-8	5,636 (5,550)	3,959 (3,873)	1,677	1,428	30.0 (30.0)	54.0
Aldine	1-8	4,786 (4,436)	2,801 (2,451)	1,985	1,120	41.5 (44.9)	63.9
Jones	2-8	4,532	2,637	1,895	1,210	41.8	61.3

The figures without parentheses in columns 3, 4, and 7 are only approximately true, for as was noted previously only the gross number of "speller only" words was obtained, the amount of repetition therein being disregarded. Hence a slight source of error in the figures of these columns. The figures in parentheses in the columns represent the same results on the assumption that the repetition in the "speller only" words is the same as in the "overlap" words.

speller. Record was also kept of the particular grade in which each word in each speller was taught.

The facts concerning the overlapping of the five spellers and the Anderson list are presented in Table I. The first column of this table gives the name of the speller; the second column, the grades in which it is supposed to be used; the third column, the total number of words in the book; the fourth column, the number of "speller only" words; the fifth column, the number of "overlap" words, i.e., words common to the speller and the list; the sixth column, the "list only" words, i.e., words in the Anderson list but not included in the book; the seventh column, the percent of the total number of words in the speller represented by the "overlap" words; the last column, the percent of the Anderson list incorporated in the speller.

Table I makes it evident that if the number of words included in the "overlap" (column 5), or if the percent of the Anderson list included in the "overlap" (column 8) is taken as a basis of comparison, the relative standing of the books is as follows: Aldine first, with 1,985 "overlap" words representing 63.9 percent of the Anderson list; Jones second, with 1,895 "overlap" words representing 61.3 percent of the Anderson list; Merrill third, with 1,677 "overlap" words representing 54.0 percent of the Anderson list; Champion fourth, with 1,424 "overlap" words representing 45.9 percent of the Anderson list; Peirce fifth, with 784 "overlap" words representing but 25.2 percent of the Anderson list.

To the practical minded superintendent the above comparison is fair and just for since the speller determines to so great an extent what words will be taught it is logical to insist that the subject matter of that book is best which contains the greater number or percent of the commonly used words. However, the Champion, the Peirce, and the Merrill, as shown in column 2, are intended for grades III to VIII—inclusive; the Aldine, for grades I to VIII inclusive; and the Jones, for grades II to VIII inclusive. Consequently one might expect differences in the total number of words in the spellers and more chances of overlapping in those books containing the most words. Column 3 shows that the books do vary greatly in the total number of words included—from 2,991 in the Peirce speller to 6,270 in the Cham-

pion—but comparisons with other columns in the table show little relation between the number of words in the book and the amount of overlapping. Column 7 shows that in the Aldine and Jones spellers the "overlap" is a little over 40 percent of the total spelling vocabulary while in the other spellers it ranges from 22.7 to 30 percent. Such facts tend to show the superiority of these first mentioned spellers.

To eliminate the charge that it is unfair to compare books primarily intended for grades III to VIII inclusive with those intended for more than these grades, comparisons were made disregarding the word lists in the Aldine and the Jones spellers intended for grades below the third. From Table II representing such comparison it is seen that the Jones and Aldine spellers still rank very high in the number and percent of the Anderson lists included in the "overlap" but the Merrill speller ranks higher. When comparison is made of the percent of the book total repre-

TABLE II. COMPARISON OF THE FIVE SPELLERS WITH THE ANDERSON LIST ON THE BASIS OF THE WORD LIST FOR GRADES III TO VIII INCLUSIVE

Speller	Grades	Total Words in Book	"Speller Only" Words	"Overlap" Words	"List Only" Words	Percent of Book Represented by "Overlap"	Percent of Anderson List Included in "Overlap"
1	2	3	4	5	6	7	8
Champion	3-8	6,270 (5,872)	4,846 (4,430)	1,424	1,681	22.7 (24.2)	45.9
Peirce	3-8	2,991 (2,862)	2,207 (2,078)	784	2,321	26.2 (27.0)	25.2
Merrill	3-8	5,636 (5,550)	3,959 (3,873)	1,677	1,428	30.0 (30.0)	54.0
Aldine	3-8	3,888 (3,400)	2,429 (1,941)	1,459	1,646	40.0 (43.0)	47.0
Jones	3-8	4,008	2,524	1,484	1,621	37.0	47.7

sented by the "overlap" then it is clear that the Jones and the Aldine spellers contain a much smaller percent of words of "low probability of usefulness."

Thus far all comparisons have been made with the Anderson list as a whole; but, as was pointed out by Ayres in his attempt to identify the two thousand most commonly used words, the greater the number of words the more they vary according to the subject matter under consideration, and the less reliable the conclusion about their being most commonly used. Consequently the Anderson list was divided into six parts. Part I consists of the 79 words that make up the first five deciles of the Anderson list, i.e., those words which with all their repetitions account for five-tenths of the 361,184 running words that are contained in the Anderson source material. Part II consists of the 213 words in the sixth and seventh deciles. Part III consists of the 303 words of the eighth decile. Part IV consists of the 849 words of the ninth decile; Part V consists of 1,661 words of the tenth decile which were used 5 or more times. Part VI consists of the remaining 6,118 words of the tenth decile—those words in the Anderson source material but not listed as most commonly used words.

The number of words in the different parts together with the variation of the number of times the different words were used are presented in tabular form below.

TABLE III. SHOWING NUMBER OF WORDS IN THE DIFFERENT PARTS AND THE VARIATION IN THE NUMBER OF TIMES THE VARIOUS WORDS USED

Number of Parts	Number of Words	Range in Number of Times Used
I	79	677—11,893
II	213	185—675
III	303	79—185
IV	849	24—79
V	1,661	5—24
VI	6,118	1—5

A glance at Table III shows that each part varies in two respects, the number of words and the number of times the words

were used. It is furthermore noted that where there are few words in a part they are used many times and where there are many words they are used few times. "Few words and many times used" signifies most commonly used words, and "many words and few times used" signifies words of low probability of usefulness. Consequently that book which contains the highest number and percent in the first parts of the list will contain the most of the commonly used words.

Table IV, showing the number of words in the five spellers that are found in each of the six parts of the Anderson source material, reveals great variation among the different books in the number of words found in the respective parts. It is interesting to note that the Aldine and the Jones spellers usually contain more words in Parts I to V inclusive and fewer words in Part VI. These facts stand out more prominently in Table V, which presents the figures for Parts I to V inclusive reduced to percents.

TABLE IV. NUMBER OF WORDS IN THE FIVE SPELLERS THAT ARE FOUND IN EACH PART OF THE ANDERSON SOURCE MATERIAL

Speller with Book Total	Part I (79 words)	Part II (213 words)	Part III (303 words)	Part IV (849 words)	Part V (1,661 words)	Part VI (6,118 words)
Champion 5,872–6,270.....	19	113	181	452	659	4,500-4,800
Peirce 2,862–2,991.....	8	52	88	255	381	2,000-2,200
Merrill 3,350–3,636.....	30	153	216	466	812	3,775-3,950
Aldine 4,436–4,786.....	79	118	206	618	964	2,500-2,800
Jones 4,532.....	76	200	255	569	795	2,636

Table V should be read as follows: The Champion speller, which as a book included 45.9 percent of the 3,105 words of the Anderson list, contained 24 percent of Part I, 53 percent of

TABLE V. PERCENT OF THE ANDERSON LIST AND OF THE FIRST FIVE PARTS CONTAINED IN EACH SPELLER
(Computed from Table IV)

Speller with Percent of Anderson List Included	Part I (79 words)	Part II (213 words)	Part III (303 words)	Part IV (849 words)	Part V (1,661 words)
Champion 45.9	24	53	60	53	40
Peirce 25.2	10	24	29	30	23
Merrill 54.0	38	73	71	55	49
Aldine 63.9	100	55	68	73	58
Jones 61.3	96	91	84	67	48

TABLE VI. SCORES WHEN THE PERCENTS OF OVERLAPPING GIVEN IN TABLE V ARE WEIGHTED ACCORDING TO THE NUMBER OF DECILES IN EACH PART

Speller	Part I (500)	Part II (200)	Part III (100)	Part IV (100)	Part V (50)	Total (950)
1	*2*	*3*	*4*	*5*	*6*	*7*
Champion	120	106	60	53	20	359
Peirce	50	48	29	30	12	169
Merrill	160	146	71	55	25	457
Aldine	500	110	68	73	29	780
Jones	480	188	84	67	24	843

Part II, 60 percent of Part III, 53 percent of Part IV and 40 percent of Part V, etc. This table merely serves to reemphasize the superiority of the Jones and Aldine spellers when checked against the Anderson list of commonly used words.

To give a more complete evaluation of the books on the basis of their selection of commonly used words, the parts were weighted according to the number of deciles or the part of a decile which the words therein comprise. Table VI showing the results of such weightings is derived from Table V by multiplying the percents for Part I by 5, i.e., the number of deciles in that part; the percents for Part II by 2; for Part III by 1; for Part IV by 1; for Part V by ½. By this system of weighting the perfect scores for Parts I to V respectively are 500, 200, 100, 100, and 50; and the perfect score for the five parts taken together 950.

The total scores as given in column 7 show that the spellers should be ranked as follows: Jones, first; Aldine, second; Merrill, third; Champion, fourth; Peirce, fifth.

It should be pointed out that even though the Jones speller is given first rank according to the weighted scores, the Aldine speller has a higher score in three of the five parts. When the books were ranked according to the percent of the Anderson list included (Table I), the Aldine speller excelled the Jones by a narrow margin. When the books were ranked on the basis of the word lists for grades III to VIII inclusive (Table II) the Jones speller excelled by seven-tenths of one percent. All of these facts tend to show that little difference exists between these two spellers, and that superintendents and teachers would make little mistake in choosing either book, so far as spelling vocabulary is concerned.

On the whole, this study shows a great range in the size of the spelling vocabulary—from 2,991 words in the Peirce speller to 6,270 words in the Champion speller. It also shows the significant fact, so far as these books are concerned that little relation exists between mere size of vocabulary and the number of most commonly used words included. For example the Champion speller with 6,270 words contains but 45.9 percent of the Anderson list while the Jones speller with 4,532 words contains 61.3 percent of the list—which fact signifies that the selection of a spelling vocabulary is something more than merely collecting so many words. The study also shows that the ratio of the number of

commonly used words to total number of words in the book varies from 41.8 percent in the Jones speller to 22.7 percent in the Champion speller. In cold facts these figures mean, if we may safely argue from the basis of the Anderson list, that from 58 to 77 percent of the time devoted to spelling within the public school is spent upon words *not commonly used*. Is not one cause of the charge sometimes heard today that children are not efficient in spelling due to the fact that *we teach the children one list of words in the school room and the world expects them to spell another list when they leave the school room?*

The study shows that the Jones and Aldine spellers rank high, no matter whether considering the number or percent of the Anderson list included, the ratio of the words of the Anderson list to the total number of words in the book, or the final scores determined through the adopted system of weighting the words according to their position in the Anderson list. When only the vocabularies intended for grades III to VIII inclusive are compared the Merrill speller includes a higher number and percent of the list, but this speller is surpassed by the previously mentioned books in all other phases considered.

One must conclude then that the Jones and Aldine spellers are superior to the other three spellers under consideration as far as choice of vocabulary is concerned. This does not mean that they are superior in other respects, nor does it mean that they are superior to other spellers on the market today, especially those which have just recently come from the press. The selection of a speller, to be wholly scientific, should take account of all spellers and all aspects of the different spellers; but this was impossible in the present investigation. Such investigations require time and energy; but it can safely be predicted that until they are made we shall continue to select books, which cause children to spend their time upon words which they will probably never use, and we shall continue to select books incorporating inferior methods. Proper utilization of scientific method in the selection of spellers or other textbooks will hasten the application of the best established psychological principles and will guarantee progress in the realization of the social point of view.

THE EDUCATIONAL OBJECTIVES OF THE ILLINOIS HIGH SCHOOL CONFERENCE

H. A. HOLLISTER
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The High School Conference which meets annually at the University of Illinois has taken as its definite task the universalizing of high school education for the state. Naturally the carrying out of such a project calls for the removal of numerous obstacles and the making of important readjustments. These preliminary steps call for much investigation along several different lines for the accomplishment of which a number of committees have been named. These committees are to operate under the direction of a central committee from the faculty of the College of Education of the university.

The studies for which committees have been chosen thus far are as follows:

1. Readjustments needed in the high school curriculum and in that of the schools leading to it.
2. Existing conditions in the state for the training of teachers and needed extension of such facilities.
3. Continuation or part-time schools—where needed, of what character, and how they are to be provided.
4. The possibilities of the all-year school—is it desirable and practicable for Illinois.
5. Provisions to be made, other than those now existing, for compulsory attendance; and the extent to which there may be necessity for subsidizing families economically incompetent in order to keep their children in school.
6. The need of extending facilities for high-school education through the organization of community high schools; the defining of an economical high school, and the problem of transportation of pupils.

At the last session of the conference a seventh committee was provided for—a committee for the study of the method of readjusting the curriculum as it affects the economics of instruction and the time and sequence elements of the problem.

It seems fitting at this time to discuss in brief detail what is involved in the way of investigation and research in these various committee assignments. Such a discussion seems all the more desirable in view of the fact that some of those interested in the movement seem not to be able to visualize the entire situation with sufficient clearness to enable them to see the necessities calling for such an extended survey. Let us take the problems, then, in the order named above.

The demand for curriculum readjustment seems to be universal, and just now there is apparently a tendency to get at the real objectives of education as a basis for such readjustment. The logical order seems to be: the determination of objectives, the selection and arrangement of materials and processes best calculated to become effective in their attainment, and the method to be pursued in the use of such materials and processes. A committee of the N. E. A. has given us a statement of objectives. But the presentation by the chairman of our conference committee, Mr. R. L. Sandwick, seems to be a better statement or classification for our purposes.

The next step, the selection and arrangement of subject matter and processes, is a far more complicated and difficult problem. We have been going on from the very beginning of our common school system with a process of unorganized accumulation of materials, both new and traditional, in a hopeless jumble. Like a retail dealer of dry goods and notions who could never manage a successful "clearance" sale we have been encumbering the shelves and attic of our educational shop with old and out-of-date stuff, much to the disadvantage of any effective "display" of the new. Is it not high time that we should take an inventory of the "goods" on hand with reference to the needs of our "trade," arranging them in the most advantageous way possible, and disposing of all non-essential and out-of-date stuff even at a sacrifice if necessary?

Such a process of weighing and testing will require much patient work; but there is no other real readjustment to be had. We shall need to apply mercilessly the tests which a clear understanding of our educational objectives should make possible. No might-have-beens or vague possibilities of the future should remain to mar our work. It is evident, then, that those who

are to participate in the testing process must first get clearly in mind the fundamental objectives of school education as determined by life needs. It will be necessary, also, that a considerable number of our best qualified teachers be available for service in this educational inventory.

The third step in curriculum reconstruction, as affecting the economics of instruction and the time and sequence relations, must, for the most part, wait upon the progress of the second step. But there is here a preliminary work to be done which may well employ the attention of such a committee until such time as it may be able to act jointly with the committee on readjustment of content of the curriculum. This preliminary study by a committee on method should result in a classification of principles of general method together with an attempt to evaluate them on a basis of accomplishment. In making such a study it will be desirable as far as possible to avoid mistaking the special application of a principle, at a given time or under a given name, for an *entirely new* principle of method.

The second study, that of teacher training, was clearly outlined in a general way in the preliminary report of the committee last November. The necessity of the situation was made very clear. There remains to be made now a careful survey for the purpose of determining the number and character of teachers necessary to carry through successfully any plan of readjustment and extension of high-school education that may result from the work of the first committee. In order to do this it is desirable, as in the case of curriculum reconstruction, to take into consideration the needs of the elementary schools as well as of the high schools. This investigation will be conducted under the direction of Dr. B. R. Buckingham, acting for the committee of which President Felmley is chairman. The study will include not only the sources of teacher supply but also their distribution, salary, tenure of service, and preparation for their work.

The third committee having in hand the problem of continuation schools is now facing a difficult problem. We already have a law on the statute books providing for the progressive and obligatory establishment of such schools until all boys and girls of ages up to and including eighteen are in attendance. But we do not know where or what kind of continuation schools

are needed; we have not enough teachers available to handle them; we do not know how the law is to be enforced; and the problem of financing such an extensive addition to our educational system has, as yet, received little or no consideration. Moreover we have not yet learned how we are to motivate the work for that considerable number of boys and girls who are out of school simply because they do not like school work as commonly organized, especially where academic subjects are concerned.

It seems evident, therefore, that there is much for this committee to do, and that it should be done as promptly as possible, if we are to save a really good piece of legislation from disastrous failure. The saner way would have been to have studied the situation first and then to have sought such legislative enactment as would fit the case.

The fourth committee has a similiar though newer phase of the problem to consider—the all-year school and its adaptability to our needs in Illinois. First of all such a committee should ascertain how this plan is working where it is already in use. It should study the various vocations in order to see how and where, as a type of continuation school, it will best serve the interests of individuals and of the state. It is possible that this type of school may be just the one needed for children of the rural districts especially.

Another problem closely allied to the third and fourth, and one which may well be handled cooperatively by these three committees, is the problem of compulsory attendance and of economically incompetent families, as assigned to committee number five. Here again methods of motivation and ways and means of effectual enforcement of law must be seriously considered. This study should include a thorough investigation of compulsory attendance laws in other states, the manner of their enforcement and the results attained. The economic problem involved in the case of families lacking adequate adult workers as bread winners needs to be carefully surveyed and the most constructive treatment possible provided.

It is useless to consider any plan for universalizing high-school education without providing schools sufficient in number as well as in character to take care of all classes of pupils who should attend. To this end the sixth committee named above was

provided. Naturally the first step should be to locate the sections where suitable high-school facilities are now lacking and to determine approximately the number and character of schools needed. This will mean a careful survey of the state for the purpose of ascertaining where there are children of high-school age—fourteen to eighteen—for whom there is at present no suitable high school available. The lack may be due either to the absence of any school near enough to be available or to the lack of any fitting type of instruction which local interests or predominant individual inclination seem to require.

The study of this committee also involves the effort to determine when a high-school organization is economically justifiable. This would imply some way of providing for a possible few who would otherwise be without high-school advantages. Thus the problem of transportation of pupils living at a distance too great for walking also falls to this committee.

It appears, then, that a very complete survey of the situation is proposed and already in progress. Purposely we have confined this to problems purely educational. The great problem of financing education is left for some one to take up as a separate study. But even such a separate study must, in some measure, be able to take into consideration many if not all of the results to come from the work we have outlined for our six committees. Certain it is that the time has come for all of us to consider our educational needs in the light of our economical limitations as related to education. We must insistently demand the elimination of waste of materials, waste of teaching talent, waste of pupil time, waste from unsanitary conditions and practices and from physical defects and disease.

Such a plan of reconstruction our present situation demands. To dally with it, to halt because of its difficulties, is only to postpone it to a later day and to make the task more difficult. It is a task whose alternative is social decadence. With all of our varied studies, therefore, there needs to be a constant effort to enlist the thought and the intelligent comprehension not only of those who teach but of all leaders of thought in all communities of the state.

One of the most gratifying elements of the above program is to be seen in the fact that any significant progress made along

the lines outlined will bring its own reward. The schools will profit by any advance made if only by one of the committees, for all these committee problems stand for real needs in our educational system. So whether we attain our objective fully or not we shall, in a measure, succeed. But if we believe, with all our hearts, in a new and better Americanism, we shall, by persisting, attain the larger goal.

Editorials

PSYCHOLOGY OF THE EDUCATIONAL "STANDPATTER"

Some are educational "standpatters" because they have never done any thinking, others because they are held captive by the thinking they once did. We are here concerned only with the latter. Sometimes he is a scholar in academic lines but has reached his saturation point. The mind has crystallized prematurely. A negativistic attitude toward the new is one of the symptoms. Such an individual becomes hypercritical toward his contemporaries. He considers their work either as cheap and shoddy or else as nothing but an amplification of something from one of the favorite authors of his youth. The pose of disdainful superiority is cultivated. He cuts himself off from his fellow workers and develops the shut-in personality.

One wonders whether such persons, notwithstanding the scholarly attainments which they sometimes possess, have not after all a fundamental intellectual defect. Perhaps it is a lack of constructive imagination that robs them of open-mindedness. Their thinking seems to have no anticipatory reference. They are unable to see how things point. They can not see the new day that is dawning in education because their intellectual heads have been set on backwards.

What a relief to turn to the educational worker who instead of specializing on the destruction of the new, just because it is new, has a never failing sense for the importance of a novel contribution, even if it is imperfect or in part erroneous. Instead of wasting his energies in the attempt to overthrow a reading test or a handwriting scale or a scale for grading English compositions he tries to develop something better. While others are proclaiming that intelligence is too complex to be measured, he devises an instrument to measure it. While others are proving the impossibility of scientific vocational selection he devises and

standardizes a trade test that works. Another in the field of school administration surveys his own school and remodels his curriculum and methods in the light of the results, while neighboring superintendents and principals are inveighing against the pretensions of measurement enthusiasts.

This is not a plea in behalf of educational science. That is on its way and will not be turned back. It is rather a plea to the young men in education, whether in the academic or the practical field, to direct their talents along profitable lines. It would also point out the reflex effects upon the worker of the lend-a-hand attitude, as contrasted with the attitude of purely destructive criticism. The one attitude favors prolonged intellectual plasticity, the other brings premature hardening of the intellectual arteries. The one means professional growth, the other professional death, not less sure because it may be insidious and slow.

L. M. T.

THE VALUE OF STANDARDIZED SILENT READING TESTS

The average silent reading rate of eighth grade pupils is approximately 240 words per minute for continuous material. Scientific investigation is revealing that this rate may be greatly increased by the application of appropriate methods. On the basis of data already secured, it is conservative to say that this rate could be increased 25 percent. As a matter of fact, it is even conservative to say that it could be increased 50 percent.

Silent reading is used as a tool in practically all subjects studied in the high school or in college. The pupil who is equipped to read at the rate of 300 words per minute has a decided advantage over the pupil who is equipped to read only 240 words per minute. It means that the pupil who reads more slowly either must spend more hours upon his work or do less work.

Of two pupils who spend an equal number of hours upon their work in high school, the one who reads at the rate of 300 words per minute will accomplish one-fourth more than the pupil who reads at the rate of 240 words per minute. This will mean that in the course of four years this pupil will do 25 percent more work, which approximates the equivalent of an extra year of schooling.

The data which we have at hand not only shows that the rate may be increased, but also that the degree of comprehension can be materially increased, perhaps to an equal extent. Therefore, not only may pupils be trained to read more rapidly but at the same time they may be trained to read with increased understanding. Thus, the pupil who has been trained to read at the rate of 300 words per minute not only will gain an extra year's schooling during his high-school course, but if his training has been of the right sort, he will actually do a better quality of work.

It appears that the use of a standardized test for measuring the rate and comprehension of pupils is one method by which the rate of silent reading and the degree of comprehension may be materially increased. At least, where such tests have been used and the results properly interpreted, these dimensions of silent reading ability have been increased. Therefore, it is not idle to say that by using standardized silent reading tests systematically, it will be possible to increase the amount of education received by pupils completing the high school by 25 percent. In fact, as we have already suggested, such a prediction is conservative in view of the facts at hand.

The fundamental resources of a state are vested in the abilities of its citizens. To develop these abilities is to enrich society. The increased wealth which may accrue to the nation from the effective use of standardized tests of silent reading may be compared with the abundance that has already resulted from improved methods in science.

W. S. M.

RESEARCH AND THE PROBLEMS OF EDUCATIONAL READJUSTMENT

The decade preceding the World War was educationally notable for the advances it brought along material lines and the external aspects of school administration. Large sums were expended for school buildings, equipment, and playgrounds. New types of schools to meet new needs were created in large number. The profession of school administration was born and brought safely through the ills and dangers which always lie in wait for an infant profession.

But the war has done three things: (1) it has left the schools financially embarrassed and has checked, for the time being, material progress; (2) it has ruthlessly exposed our educational failures; (3) it has given us a host of new educational problems.

History shows that when poverty-stricken schools face insistent demands for higher efficiency the result is likely to be a development along the lines of inner organization, method and procedure. This occured after the Civil War; it will occur again. A new educational era is upon us. Not for fifty years have the problems of education been as fluid as they are today. It is a time for conscious self-searching and for conscious decision as to the attitude one will take toward the new problems of educational readjustment.

The period following the Civil War marked a renaissance of interest in educational method based upon philosophy and speculative psychology. Waves of Hegelianism and Herbartianism swept over the country. Rousseau, Pestalozzi, and Froebel were studied and debated. In the period which has recently begun questions of educational procedure are again coming to the fore, but with the difference that we are now seeking our solutions by the methods of science rather than by an appeal to arm-chair psychology. Everywhere tradition is being challenged by experiment. No method or program is sacred enough to escape the inquisitive and ubiquitous pedagogical test or scale. By means of intelligence scales the material with which the school works is subjected to the same cold analysis as the products of farm, factory, or mine. Nothing is taken for granted; everything must be proved. The spirit of educational research rules the day.

That much of this scientific endeavor will be ill directed or misapplied, and that much which is well directed will prove abortive because of the complexities of the problems, goes without saying. We may find that the conclusions of science no more than the conclusions of the *a priori* theorist can safely be accepted with the eyes shut. There may even arise a new type of pedant who will be entirely unable to think educationally except in terms of zero points, frequency curves, probable errors and mean square deviations!

Nevertheless educational research has come to stay. The only escape from the errors of scientific method is by a more

careful and sagacious use of that same method. The best cure for the scientific pedant will be such a development of his methods as will show finally where the boundaries lie beyond which those methods are not for the present applicable. There is little danger that opponents of the scientific movement in education will be able seriously to retard its progress. There is every likelihood that such opponents of the inevitable will lose whatever opportunities they might have had to shape the course of modern educational currents.

L. M. T.

MENTAL AND PHYSICAL AGE IN RELATION TO SCHOOL ADMINISTRATION

Compulsory education laws are driving thousands of children to the schools who, under former conditions, would not have attended. The statutes make no distinctions except those based upon chronological age and "physical or mental disability." It is assumed that when a child is six years of age, he is ready to enter the first grade. Many children are ready before their sixth birthday, many others will not be ready until later, and still others will never be ready at all. If we are going to speak in terms of age, let us use the ages which really apply. When we say that a six-year-old child is ready for school, we at once get into difficulties because of the wide range of both the physical and mental abilities of such children. We need a finer adjustment than chronological age provides. Evidently then, for school use we must have a different conception of age. If six years is the standard for entrance, we must define it as six years *physically* and six years *mentally*. Thus we have the conception (1) of physical or anatomical age and (2) of mental age. Both of these have real application to the work of the school and to the competence of children to do the work.

We can measure physical age and mental age with surprising accuracy. It is gradually becoming incumbent upon the school to do this. An x-ray photograph of the wrist bones indicates clearly their degrees of ossification. A series of standard photographs each representing average development for a chronological age will permit the matching of each child's photograph against the series so that the skeletal development of a child may be

determined in terms of *years*. This skeletal development is a reliable index of physical maturity. Almost as good an index of physical maturity, however, may be obtained from an examination of a child's teeth. Since permanent teeth should normally appear in a fixed order and at relatively fixed chronological ages, the number and character of these teeth furnish a reasonably accurate measure of physical maturity. Anyone can apply this method, for the teeth are obviously either present or absent. All one needs in interpreting the results of the count is a table indicating the ages at which the teeth appear in the child whose anatomical or physical development is normal.

Evidence shows that anatomical age corresponds much more closely to mental age than does chronological age. But although anatomical age is a much safer criterion than chronological age as a basis of school procedure, it is insufficient. In all cases it must be supplemented by a knowledge of mental age. After all, a child's success in school depends primarily upon his intelligence. The means of measuring intelligence are multiplying. The most brilliant constructive achievement of psychology and the most useful of its many gifts to education has been the Binet-Simon Intelligence Scale. This scale reveals in terms of age the mentality of children. It is a "wonderful instrument" although critics are agreed that its usefulness in measuring intelligence beyond that of the normal child of thirteen or fourteen is relatively less than it is for lower degrees of intelligence.

We are now, however, on the eve of another important application of psychology to education. The Binet-Simon Scale showed the possibilities of mental measurement in the schools. It remained, however, for the psychologists to devise a means of mental measurement which could be applied quickly, cheaply, and without the services of a specially trained examiner. Such means of measurement are now available. Some of them are being commercially distributed. The validity of these "group tests"—the extent to which they really measure intelligence—and their reliability must be more fully established. But their usefulness is now beyond question. They are not substitutes for individual tests. They give a reasonably accurate general impression. Pupils showing extreme scores should be given the Binet test.

With knowledge of the mental ages of children supplemented by knowledge of their anatomical or physical ages, we shall be better able to adjust the work of the school to that wide-ranging human variability which is everywhere present and which we cover with the term "individual differences."

We are confronted with the necessity for training large masses of pupils. Perforce we must organize them into classes. The real task of the modern school, therefore, is to reach the individual through the group. This can only be done on the basis of a grouping according to the things which really determine success in school work.

Boards of education should provide for a survey of at least the mental levels of all the children in the schools which they control. About twenty percent of the children should receive special education of some kind. The intelligence of about ten percent is so far below normal that their training must consist of activities which call for relatively little mental ability. Reading, writing, spelling, and arithmetic, although they are subjects ignorance of which is a misfortune, are also subjects which children of certain intellectual levels can never learn. If a child's mental age is only half of his chronological age, he has an intelligence quotient of 50. This will remain relatively fixed. Such a child will never become much more than eight years old mentally. He cannot learn arithmetic or even enough reading and writing to do him any good. If his intelligence quotient is 70, we may teach him some reading and writing, but it will be useless to try to teach him more in arithmetic than the fundamental operations and very simple notions of fractions. Children of intelligence quotients of 70 or 80 sometimes reach the high school. They take up Latin and algebra although they never succeed in these subjects. Indeed, we know that the high school as it is at present organized affords no place for children of such a degree of mentality.

There are, however, a vast number of children whose intelligence is below normal but not very seriously so. While these children can profit by the teaching of the common branches in their more elementary form, they should be given considerable industrial training for they will recruit the ranks of unskilled and semi-skilled labor. We need not suppose that they will be either

economically incompetent or unhappy. An increasing amount of the work of the world is being done by them; and their rewards—at least in wages—are already large, and they are increasing.

Accordingly, the task of the school is, first, to identify those whose lot it will be to serve in these capacities and, second, to give them such intellectual training as they can use and such vocational training as will fit them to perform competently the sort of work they will be called upon to do. The kinds of manual work best suited to each mental age has now been worked out in considerable detail. A woman of the mental age of seven may be taught to do well certain forms of housework, plain sewing, rug weaving, lace making, and a number of other occupations. A man of the same age may do good housework or laundry work, may do "outside work" or teaming, brush making, and bench work. In fact, the number of possible occupations for such men is rather large. Semi-skilled labor such as some employees in stores, policemen, firemen, car men, and some of the lower forms of clerical work may be and indeed should be done by persons possessing an intelligence inferior to normal, or at least not higher than normal.

At the other end of the scale of intelligence there are some eight or ten percent of the children whose gifts are so superior that they should not be subjected to the school training which is now supposed to be adjusted to the abilities of the normal child. Since, in the case of the superior child intellectual ability is predominant, he can negotiate the regular course of study in less time than can the normal child; for the regular course of study is essentially intellectual in its appeal. Many children, capable of completing the elementary school in from four to six years, are being unfairly treated and permitted to fall into loose habits of study by being required to spend eight years in the elementary school.

Not only should the gifted child progress more rapidly than the normal child, but his work should differ also in quality and method. Additional problems, more significant relationships, supplementary assignments, collateral readings—all the types of activities which we would like to carry on in the schools but for which the "minimum essentials" permit so little time—these should be prominent in the training of gifted children.

Yet special provision for gifted children is almost non-existent. Without the aid of intelligence tests the gifted child is much less frequently identified than the dull or defective child. Superior children do not call attention to themselves; they may occupy moments of enforced idleness in ways of their own choosing, but they are successful in their work. With a truly human propensity they adjust their effort to the requirements and no one may discover that they are capable of better things. This is part of the reason why we are regaled with stories of what dullards some eminent men were in their school days. If Byron and Goldsmith, Darwin and Gray were unappreciated by their teachers, we may be quite sure it was the fault of the teachers and of their means of appraisal.

The psychologist and the teacher are getting together on this question. The psychologist has simplified his methods of testing and he is training the teacher to use the simpler instruments. On the other hand, school people are realizing with conviction that they need to know and to know in terms of the new methods of measurement, the physical and mental development of the children entrusted to their care. No educational movement which goes to make up the modern trend of educational thought and practice promises more for the good of the children than does the movement which calls for the physical and mental measurement of school children and the adjustment of school procedure in accordance with the facts as revealed by these measurements.

B. R. B.

Reviews and Abstracts

TERMAN, LEWIS M. *The intelligence of school children.* Boston: Houghton Mifflin Company, 1919. 317 pp.

This book is written by an expert for the use of practical people. The number of such books is increasing. There is a cycle through which a movement passes. The idea begins by engaging the attention of a specialist to whom its implications may at first be but vaguely apparent. If he is a university man, he perhaps interests a few graduate students in his idea and writes some more or less technical articles about it—articles which practical people cannot read and which they are inclined to belittle. As the idea progresses through this stage of its development, it may begin to attract wider attention, to enlist workers in new centers, and to reveal some of its applications. Thus it comes to have a practical meaning and begins to touch the lives of a large number of people. Finally, the expert who began it may give it a broader, finer, and truer interpretation—an interpretation which he who runs may read and which cannot be ignored or undervalued by practical people.

So it is with the intelligence testing of school children. This book is written as the preface states "primarily for the grade teacher." Not so long ago the subject was engaging no attention outside of the psychological laboratory and a few institutions for the feeble-minded. The announced purpose of the book is "to illustrate the large individual differences in original endowment which exist among school children and to show the practical bearing of these differences upon the everyday problems of class-room management and school administration."

The Binet-Simon Scale, which Dr. Terman has done so much to refine and adapt for American use, is the chief means of measuring intelligence recognized in this book. Appropriately, therefore, a brief description of the scale and of the derivative measures based upon it is given in the beginning. This is followed by a general treatment of individual differences and a specific statement of their amount and meaning in the kindergarten, in the first and fifth grades, and in the first year of the high school.

It appears that a large proportion of kindergarten children could do satisfactory work in the first grade. But advancement to the first grade depends upon chronological age—upon living six years. As the author says, "the most abrupt break in the curriculum is that from the kindergarten to the first grade." Nowhere else from the first grade to the university does

advancement depend so exclusively upon age. "The kindergarten alone holds aloof, worships at the shrine of a special methodological cult, and treats its children as belonging to a different order of human beings." The need for intelligence testing in the kindergarten and of action based on the results is, therefore, especially evident.

Two first-grade classes, reported by the author, differed in average mental age by more than two years. Yet the teachers of these classes were expected to accomplish the same work. The teacher of the poorer class was in despair and her efficiency was doubted. But there was nothing wrong with the teacher. Her task was simply impossible. Differences between the mental ages of pupils in the same grade are even greater for higher than for lower grades.

As to high-school conditions, children are found to be unlikely to graduate if their mental ages are less than 0.9 of their chronological ages—in other words, if their intelligence quotients are below 90. Since "nearly a third of all children test this low or lower," the author declares that "high schools at present are in a measure 'class' schools."

Mental age is offered as a standard for grading. It is shown that if a child's mental age corresponds to the normal age for his grade, he will do average work. Incorrect grading is everywhere apparent. The dull child is promoted too much and the bright child too little. "The typical bright child, though already under age, would generally continue to do satisfactory work if promoted one or two grades."

Dullness is incurable and brightness persists. The intelligence quotient (I.Q.) is the measure of these, and it remains substantially constant. Between the first and second of 428 pairs of I.Q.'s the correlation coefficient was +0.93. Since intelligence practically reaches its maximum at the age of 16, we may by multiplying 16 by the I.Q. predict with considerable certainty what a child's ultimate mental age will be. Evidently, therefore, in the intelligence quotient we have a basis of prediction which has great value in educational and vocational guidance. It will not tell us what specific studies or occupations a child should pursue, but when the minimum intelligence required for success in each study or occupation has been learned, it will tell us what *groups* of subjects a pupil may attempt and in what *types* of work he may engage with the probability of success. Within the studies or occupations appropriate to a child's mentality choice may be made on the basis of inclination or opportunity.

Children should not be directed into occupations for which they have more intelligence than is of use. For many kinds of employment the intellectual demands are low, yet the rewards are by no means small. Present industrial developments are finding a larger and larger use for persons of inferior mentality. But in unskilled and semi-skilled occupations, intelligence above a certain level is not only unnecessary but harmful. Children, therefore, having such intelligence should be directed towards the higher types of vocations for which they are fitted. A nation's intellectual assets are priceless, and the principle of conservation will here have its most far-reaching

application—an application in which the teacher occupies the strategic position.

The author takes the attitude that unless the rank and file of teachers learn to use intelligence tests, the grading of children according to ability "will remain largely a Utopian dream." He advocates the introduction in normal schools of a half-year course of three hours per week, or of a summer session course, to prepare teachers for Binet testing. He believes, however, that teachers in service may learn the Binet procedure, and in the last chapter of his book he gives helpful directions as to how this may be done. While the supervision of a psychologist or of a person experienced in the use and interpretation of the tests is desirable, it is believed that gross errors may be avoided without such assistance. The results of the tests will never make unnecessary the securing of supplementary data from teachers and parents and the use of caution and common sense. Action, especially if based upon an assumption of feeble-mindedness or dullness, should not be taken until the results have been carefully scrutinized and compared with data as to school progress and attendance, illness, physical defects, occupation and nationality of parents, and data concerning the probable mentality of other members of the family.

Ordinarily it takes about forty minutes to test a child—somewhat less with primary children, somewhat more with the upper grade and high-school children. Where time does not permit the use of the entire scale, the author suggests abbreviations of it. He also recommends the use of some of the recently devised group tests which can be given simultaneously to an indefinitely large number of children. Group tests do not yield as dependable results as does the Binet Scale. They should be followed by a more thorough examination of children who make exceptional scores. Even the results on the Binet test are not to be taken too literally. While errors are relatively small, one must remember that the occasional error is just as serious for the child concerned as it would be if it occurred more frequently. Care in interpreting results, re-testing in the case of unusual findings, comparison with the results of educational and physical tests, with teachers' and parents' estimates, and with social conditions will prevent mistakes.

To us the most fascinating chapters of the book are those devoted to the special study of a selected number of superior children. Facts, some of which are contrary to common belief, are disclosed. The superior child is not "queer," nor physically weak. His moral qualities are likely to be superior, and his mental development is usually general rather than one-sided. His superiority is shown early in life and is permanent. Yet he is usually found in a school grade two or three years below where he belongs by virtue of his ability.

The case histories of forty-one superior children are given. They present a vivid, concrete picture of what the superior child is like. Too frequently they show how utterly these children are misunderstood and unconsciously thwarted by their teachers.

We know no more inspiring reading for teachers than these chapters on superior children. They dispel old notions and throw light upon dark places.

The conviction is forced home that such children may actually be in the reader's class, unrecognized opportunities for a type of service which every teacher worthy of the name will eagerly seek.

B. R. B.

Pearl, Norton H. and Brown, H. E. *Health by stunts.* New York: Macmillan Co., 1919. 216 pp.

This little book, written by supervisors of physical education in the Detroit public schools, who also served as directors of athletic activities in the army training camps, and with the A. E. F. in France, will be welcomed, not only by supervisors and teachers of physical education, but by parents, by boys and girls, and by all who are interested in the building up of an American manhood and womanhood sound in body as well as in mind. The volume gives by verbal description and by photographic illustrations directions for performing a series of graded exercises, or better, "stunts" which are in effect a series of rough standard tests of physical ability and condition. Research men will be interested in finding many illustrations of both performance tests in which rate of accuracy are scored directly, and of ability tests where scores are determined merely by success or failure. Teachers and supervisors of physical education will value highly many suggestions in regard to methods of organizing physical education work in the schools, of conducting contests, of scoring and tabulating results, and so on, but the chief interest to workers in educational measurement is to be sought in the many possibilities the book reveals for the construction of standardized tests of physical ability. It is probable that those responsible for physical education in our schools will soon feel the pressure for proof of results which the public is exerting on every phase of public education. When the time comes for surveys and tests, this little book should prove a rich mine of test material.

For instance, in Detroit, the contestants to qualify for the Decathlon must pass a series of preliminary tests administered under standard conditions. He must be an eighth-grade boy, without organic weakness. He must be able to chin himself six times, do the "set up" sixteen times, the "floor dip" ten times, have a grip of at least sixty pounds and a lung capacity at least two and six-tenths times his heighth in inches. Why should there not be such age-grade standards of physical fitness all along the line? When the product of all physical training is checked against suitable objective standards it will become much more effective than it has in the past, and the physical fitness of the average American will be assured.

S. A. C.

Bobbitt, Frank M. *The curriculum.* Boston: Houghton Mifflin Co., 1918. 295 pp.

During the last ten years increasing attention has been paid to the construction of curriculums in school subjects, particularly in the fields of spelling and language; but no systematic treatise has been published during that time until the appearance of Professor Bobbitt's book.

The book is refreshing in its beauty and simplicity of style. It reads easily and speaks directly to the point in dealing with the topics under discussion. These are grouped in six sections: ends and processes, training for occupational efficiency, education for citizenship, education for physical efficiency, education for leisure occupations, and education for social intercommunications.

In the first section the groundwork for treatment of the remaining groups is laid. In this section a valuable distinction is made between experience gained by undirected study on the play level and that obtained by directed study on the work level. Of particular significance is the author's claim that after experience has been gained without direction by children, the curriculum that follows this "*aims at those objectives that are not sufficiently attained as a result of the general undirected experience.*" Or, to paraphrase, after a child has picked up what he will by himself, the school should discover his shortcomings and correct those. Thus, for instance, the author says, in language, the school curriculum should be based upon the language errors of children. In vocational education it should be based upon occupational deficiencies.

It is not entirely clear in my mind whether undirected experience is a part of the curriculum or not. The author does not discuss the point; but this is probably an oversight. Obviously, it is not practicable to let children pick up experience everywhere. If a child is turned into a library to browse, it is necessary that the books be selected upon some basis. If he is allowed to run at large, the boundaries must be set in some way: the sawdust of a saloon floor ought certainly to be taboo for a growing boy. And, if this "undirected experience" is really selected and, therefore, part of the curriculum, errors and shortcomings will hardly constitute an adequate basis for selection. An interesting argument, at least, could be made on the subject.

It is unfortunate that the author does not show the applications of the shortcomings concept to the construction of directed curriculums in citizenship, physical education, literature, and the foreign languages. But this is probably not an omission because the text is a "first book" and deals largely with the functions of the activities mentioned, rather than with the content of the curriculum necessary for the realization of each.

The book is timely and will be of fundamental value to any student of the curriculum.

W. W. C.

PUBLICATIONS RECEIVED

Baker, Franklin T. and Thorndike, Ashley H. *Everyday classics.* New York: Macmillan Co., 1918-1919. 6v. (Third-Eighth Readers.)

Baker, Franklin T. and Thorndike, Ashley H. *The teaching of reading: a manual to accompany everyday classics, third and fourth readers.* New York: Macmillan Co., 1917. 93 pp.

Beard, Charles A. and Bagley, William C. *The history of the American people.* New York: Macmillan Co., 1919. 686 pp.

Bibliographies

A BIBLIOGRAPHY OF STANDARDIZED TESTS FOR THE HIGH SCHOOL[1]

WALTER S. MONROE,

Assistant Director, Bureau of Educational Research, University of Illinois

In addition to standardized tests designed to measure the abilities of pupils in high-school subjects, certain tests designed for use in the elementary school have been given to high-school pupils. In assembling this bibliography an elementary school test was included if a published report of its use in high school was found. Doubtless other elementary school tests have been or could be used with profit in the high school.

A special effort was made to have the list of tests designed for use in the high school include all of which an account had been published. A few tests have been included which are in the process of construction. Although it may be that some tests escaped notice, this list is more complete than any which has been previously published. In a few instances it was difficult to determine whether the methods used in constructing a list of questions or exercises were sufficiently scientific to justify its inclusion in this bibliography. In general, doubtful tests were included. For this reason the reader is cautioned against attaching undue importance to the fact that a test appears in this list. Before a test is selected for use, careful consideration should be given to both the method of its derivation and the results of its use. When accounts of these are lacking, the advice of competent authorities should be sought.

The list of references for a test includes the account of its derivation, if it has been published, and the more important accounts of its use. The brief annotation indicates the character of the reference.

The publisher from which a test can be obtained is given when it could be ascertained. The Bureau of Educational Research of the University of Illinois carries in stock a number of tests which are published elsewhere, and for most of these the Bureau has devised class record sheets or other accessories. For this reason the Bureau of Educational Research, as well as the original publisher, is given as a source from which such tests may be obtained. A few of the tests listed are not available for distribution. In these cases the address of the author is given if it is known. All prices are omitted because the unstability of the printing industry prevents announcing them permanently.

Under the head of "General References" there is given a selected bibliography which deals with the general topic of educational measurement. Some of the references

[1] This bibliography was prepared with the assistance of Miss Margaret Doherty, Library Assistant in the Bureau of Educational Research, University of Illinois.

pertain to tests for use in the elementary school, but they will also be found helpful by those interested in the high school field.

A section is devoted to mental tests. This particular field is developing so rapidly at this time that it is impossible to give a complete list of the tests that have been devised or that are in the process of derivation. For this reason the reader must regard this particular list as tentative and incomplete.

General References

Chapman, James C. and Rush, Grace P. *The scientific measurement of classroom products.* New York: Silver, Burdett and Co., 1917.

For the most part this book deals with tests for use in the elementary school. There are three general chapters which will be of interest to high school teachers.

Courtis, Stuart A. *The Gary public schools: measurement of classroom products.* New York: General Education Board, 1919.

Besides being a report of the use of a number of standardized tests in the Gary public schools, including the high school, this volume is an important contribution to the theory of educational measurements. The validity and reliability of the tests used in the survey are treated.

The measurement of educational products. (The Seventeenth Yearbook of the National Society for the Study of Education, Part II). Bloomington, Illinois: Public School Publishing Company, 1918.

This volume of the Yearbook is a compilation by members of the National Association of Directors of Educational Research. A complete bibliography is given.

Monroe, Walter S. "Improvement of instruction through the use of educational tests," *Journal of Educational Research*, 1:96-102, February, 1920.

This article presents a procedure for interpreting class scores and distributions with special reference to the Courtis Standard Research Tests, Series B.

Monroe, Walter S. and De Voss, J. C. and Kelly, F. J. *Educational tests and measurements.* Boston: Houghton Mifflin Co., 1917.

This is a general treatise upon educational tests and their use. Chapter VII is devoted to high-school tests.

Proctor, W. M. "Psychological tests employed in the vocational guidance of high school pupils." (To appear in the first volume of the *Journal of Educational Research.*)

Starch, Daniel. *Educational measurements.* New York: Macmillan, 1916.

This book contains two chapters upon school marks. Most of the tests which were in existence at the time the book was written are reproduced. A number of them are designed for high school subjects.

Terman, Lewis M. *The intelligence of school children.* Boston: Houghton Mifflin Co., 1919.

This book emphasizes the need for the use of intelligence tests in the classification and guidance of pupils.

Terman, Lewis M. *Measurement of intelligence: an explanation of and a complete guide for the use of the Stanford revision and extension of the Binet-Simon intelligence scale.* Boston: Houghton Mifflin Co., 1916.

I. Commercial Subjects

National Business Ability Tests

1. Test on tabulation (mental alertness)
2. Reproducing instructions
3. Test on invoicing
4. Tests on fundamental arithmetic:
   a) Fractions
   b) Percentage
5. Test in business arithmetic
6. Tests in English
   a) Spelling, elementary and advanced
   b) Grammar and punctuation, elementary and advanced
7. Elementary test in letter writing
8. Test on answering letters (advanced)
9. Stenographic tests (transcription and typewriter copying)
10. Test on copying for the mimeograph
11. Test on addressing envelopes with a pen and on filing
12. Ayres' Handwriting Scale used to judge handwriting

The nature of the above tests is indicated in a general way by the titles. For a detailed description consult Chapter v of the reference.

For each of the tests there are "two series" or two forms. It is intended that the first series be used when the test is given for the first time and the second series is to be used when it is desired to repeat the test. The two series are intended to be equivalent in difficulty.

Publisher: National Associated Schools of Scientific Business, Inc., Chicago.

Reference: Cody, Sherwin. *Commercial tests and how to use them.* Yonkers-on-Hudson, New York: World Book Company, 1919.

Part One contains the following chapters: Schools and business employment, National Business Ability Tests, principle of scientific tests, national tests in the classroom.

Part Two consists of the following chapters: Two series of National Business Ability Tests (tests are reproduced, with directions for giving and scoring), measuring classes and teachers. Appendix is devoted to the report of use of the tests in classroom.

Rogers' Stenographic Tests. This is the combination of tests which Mr. Rogers found to be useful for identifying those persons who possessed the qualities necessary for a successful stenographer:

1. For dictation
   a) Hard Directions
   b) Opposites
   c) Form Substitution
2. For grammar
   a) Hard Directions
   b) Opposites
   c) Mixed Relations
3. For typewriting
   a) Verb Object
   b) Color Making

Reference: Jaques, M. P. "Mental tests for typists and stenographers," *Industrial Management*, 58:145-46, August, 1919.

A discussion of an experiment with the Rogers' Stenographic Tests in the Brooklyn branch of the Charles Williams Company.

II. Domestic Science

Bowman and Trilling's Informational and Reasoning Tests in Textiles and Clothing. "These tests have been constructed by Leona F. Bowman and Mabel Trilling of the University of Chicago and will be described in a forthcoming number of *Supplementary Educational Monographs* published by the School of Education, University of Chicago."

Murdock's Scale for Measuring Certain Elements in Hand Sewing.
Publisher: Bureau of Publications, Teachers' College, Columbia University, New York City.

Williams and Knapp's Scale for Measuring Skill in Machine Sewing. The method of deriving this scale is similar to that used in Thorndike's Handwriting Scale.

III. Drawing

Manuel's Suggested Series of Tests for Studying Talent in Drawing. On the basis of experimental testing of nineteen persons who had marked ability in drawing, six of whom were high-school students, Dr. Manuel suggests the following set of diagnostic tests:

1. Tests of the elementary ability to represent by lines and areas, figures and objects directly observed. Drawing a horse (memory) and a toy wagon (object).
2. Tests of general intelligence (Stanford-Binet revision) with special reference to:
    a) Memory for Digits
    b) Designs
    c) Sixty Words
    d) Clock Test
    e) Vocabulary
    f) Fables
    g) Code
    h) Inclosed
    i) Paper Cutting
    j) Logical Memory
3. Tests of ability to discriminate differences in visual magnitudes (Manuel's Test in Discrimination of Visual Proportions, Manuel's Series).
4. Tests of visual acuity and normality of color vision.
5. Tests of ability to observe visually:
    a) Whipple Cancellation Tests—4 forms
    b) Rossolimo Observation Test
    c) Whipple Description of a Stamp
    d) McDougall Spot Pattern
6. Tests of memory for visual forms especially deferred memory:
    a) Rossolimo Recognition of Lineal Figures

b) Rossolimo Recognition of Colored Figures
c) Rossolimo Recognition of Pictures

7. Tests of ability to manipulate spatial forms.
a) Thurstone's Hand Test
b) Thurstone's Spatial Relations Test
c) Punched Holes
d) Rugg's Painted Cube Test

8. Tests of esthetic judgment:
a) Thorndike's Tests of Esthetic Appreciation
b) University of Illinois—Esthetic Judgment Test.

Reference: Manuel, H. T. *Talent in drawing: an experimental study of the use use of tests to discover special ability.* (School and Home Education Monographs No. 3). Bloomington, Illinois: Public School Publishing Company, 1919.
This monograph is devoted to a description of the tests and an analysis of the results obtained.

Rugg's Scale for Measuring Freehand Lettering for Use in Secondary Schools and Colleges. It consists of a series of eight samples of freehand lettering, arranged in the order of increasing merit. It may be used in measuring the efficiency of a student's work in freehand lettering.

Reference: Rugg, H. O. "A scale for measuring freehand lettering," *Journal of Educational Psychology*, 6:25-42, January, 1915.
Derivation, function, and experience with the scale is discussed.

(To be continued in the March Number.)

News Items and Communications

International Educational Correspondence

The George Peabody Foundation has recently sponsored a movement that is full of promise for the future cultural and educational relations of America with foreign nations. This is no less than the effective organization of all correspondence between pupils studying modern foreign languages in American schools and those similarly engaged in the schools of France, of Spain and South America, and of such other lands as shall eventually be included. Hitherto such letter exchange, while of great value in individual instances, has been ephemeral, spasmodic, and disorganized. It has not realized its full potentialities. The Peabody Foundation has set aside one of its buildings on the campus of the Peabody College for Teachers at Nashville as the national American office and has appointed Dr. Alfred I. Roehm as national director. With the cooperation of state and community chairmen all over the country the work of international educational correspondence is rapidly being organized.

The first branch established was the French-American Bureau. In France Monsieur Charles Garnier of the French Ministry of Education has

charge of the central French office in Paris. Lists of pupils in French and Belgian schools, who have been selected as especially fitted to inaugurate the correspondence, are sent to the American office at Nashville where the details of exchange with American schools are arranged. A similar Bureau to cover correspondence with Spanish-speaking lands has been authorized by the United States Department of State, and this will be organized immediately. Other bureaus to include other foreign languages will follow in due course.

The plans of the Peabody Foundation have received worldwide approval. The possibilities of liberalizing influences and contacts are without limit. To quote from Mr. Claxton's article in *School Life* for September 15, 1919: "Linguistic training will not be the only educational end served. Along with the letters there will be a fine exchange of historical, artistic, geographical, manufactural, commercial, and home-life material and information, clippings, picture postals, kodak views, etc., leading up to the deepest exchanges of human sympathies and ideals that will reinforce international good-will." In addition to the above article of the Commissioner of Education the reader is referred for details to a description of the purposes and plans of the Foundation in *The Modern Language Journal* for November, 1919, pages 73–76 by the present writer. Another shorter article of interest may be found in *School and Society* for September 27, 1919, page 377. It is manifest that pupils cannot at once write letters of very great value in the foreign language. Therefore it is suggested that the initial letters be in the pupil's own tongue. Thus each school will gradually have a number of model letters in the foreign idiom. Careful study of these models will be far more stimulating than the usual arid exercise of the average composition manual. The pleasure of actuality is here of great value. This has been the universal experience of teachers who have tried letter exchange in lieu of set composition. In due course the pupil will substitute the foreign tongue for his own. Each letter received is a challenge to send in return an equally good, or a better, answer. It is of course deemed wise that boys shall correspond with boys, and girls with girls, since mutual interests are thereby better utilized. While the burden upon the teacher will doubtless be somewhat greater at first than under the usual conditions of composition work, yet the same stimulus exists for teacher as well as pupil. It is even quite conceivable that the net result may prove a lessening of the teacher's task rather than an increase, since pupils invariably do better that which they like to do. At present no composition manual based upon epistolary style exists, but such books will soon appear in response to an evident demand, and they can greatly help in this important work.

It is the aim of the Peabody Foundation to establish this enterprise upon a self-supporting basis as soon as possible. Therefore communities and schools are asked to contribute to a permanent endowment fund in one of two ways. By the first or "quota method" each community will pay two dollars for each one thousand inhabitants. This single payment will entitle all persons in the community to all services of the Foundation forever. By the second or "fee method" every pupil enrolled for international correspon-

dence will pay an annual fee of ten cents. Already there have been enrollments under both these methods from every state in the Union, and the interest is rapidly spreading. Until this permanent endowment has been secured, the Peabody Foundation will bear the expense of the enterprise. Later it will be the trustee of the endowment and will render annual reports to the United States Bureau of Education.

The liberalizing effects of such a system of international correspondence are certainly beyond all doubt. All friends of education see in this plan very great possibilities of good and will be eager to contribute to its success.

THOMAS E. OLIVER
State Chairman for Illinois.

Manual Arts Conference, University of Cincinnati

The tenth annual conference of specialists in industrial education engaged in training teachers in industrial and manual arts in institutions ocated in the Mississippi Valley was held at the University of Cincinnati, December fourth, fifth and sixth, 1919. About forty-five men representing approximately as many institutions were in attendance.

These conferences are called from year to year by the United States Commissioner of Education at the request of the group, there being no permanent organization. For the past ten years Dr. William T. Bawden, Assistant to the Commissioner, has acted for the Commissioner in the matter arranging time, place, and program.

The following papers were presented at the Cincinnati meeting. The program was planned to allow generous time for discussion by the group. In fact the meeting is looked upon primarily as an opportunity for the exchange of views by those present.

"An experiment in developing a course in foreman training" by Charles R. Allen, Agent for Industrial Education, Federal Board for Vocational Education, Washington, D. C.

"Progress in the development of plans for preparing teachers of industrial subjects" by Professor James McKinney, Director of the Chicago Center of Teacher Training Department of Industrial Education.

"The itinerant teacher of subjects in village and rural schools" by Professor C. S. Van Deusen, State Normal School, Kent, Ohio.

"Provision for the training of vocational teachers in the army" by Professor R. W. Selvidge, Educational Adviser, War Plans Division, War Department, Washington, D. C.

"Opportunities for service in the field of occupational therapy" by Lieutenant Colonel Mattock.

"Training teachers of vocational and industrial work not federally aided" by Professor C. A. Bowman, Stout Institute, and W. E. Roberts, Cleveland, Ohio.

The program of the meeting also included a report of the committee on practice teaching which was concerned with plans. One of the best of these was submitted by Professor A. F. Siepert, Bradley Institute, Peoria.

A Chance to Test the Rural Schools

At the annual meeting of the Association of County Superintendents of the State of Illinois held at Springfield on December 29 a committee of five was appointed to facilitate cooperation with the Bureau of Educational Research at the University of Illinois. This committee is composed of the following members:

G. O. Smith (Chairman), Bureau County, Princeton
Mrs. Lois Coombes, Moultrie County, Sullivan
F. E. Crawford, Fayette County, Vandalia
Charles H. Watts, Champaign County, Urbana
J. W. McKinney, Williamson County, Marion.

The immediate objective of this committee is to increase the use of standardized tests in the rural schools. Already some superintendents have given one or more standardized tests in all the schools of their county but it is the feeling of the county superintendents as expressed through their state association that the use of standardized tests should become general throughout the state.

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The difficulty of reaching individual rural schools from one center such as the state Bureau of Educational Research is at once apparent. However, the relative isolation of the rural teacher creates a situation in which a standardized test can be even more helpful than to a teacher in a city school system who is working under close supervision. It will give her definite objectives for the pupils of each grade and, since in many cases she has a small number of pupils, it will be possible for her to make a relatively complete diagnosis of the shortcomings of her pupils. If these valuable instruments for measuring instruction are to become generally used in rural schools, it is incumbent upon county superintendents to be active in bringing them to the attention of rural teachers.

The action of the county superintendents of Illinois represents a progressive movement. In many states particular county superintendents have been using standardized tests in their schools for some years, but this is thought to be the first instance of concerted action by all of the county superintendents of a state.

The Federal Bureau and Educational Research

Commissioner P. P. Claxton of the United States Bureau of Education called a meeting of representatives from a number of the larger state universities at the Hotel Statler, St. Louis, Missouri, January 2 and 3, 1920. This meeting was attended by the following representatives:

University of California: R. S. French
University of Illinois: B. R. Buckingham and Walter S. Monroe
University of Kansas: F. J. Kelly
University of Michigan: Guy M. Whipple

University of North Carolina: L. A. Williams
University of Pennsylvania: J. H. Minnick
University of Texas: C. T. Gray

In addition to Commissioner Claxton his assistant Wm. T. Bawden was in attendance.

Recently, upon the invitation of the Commissioner of Education, research stations have been established at a number of universities. In addition to the institutions represented at the meeting, the following appointments have been made: University of Iowa, University of Minnesota, University of Virginia, and University of Washington.

In a circular issued September 15, the purpose of the plan of establishing research stations was stated as follows:

(1) To promote scientific research in education, and to make the results of such research available to students of education.

(2) To utilize in a national way such special resources and facilities as may be placed at the disposal of the Bureau of Education by the cooperating institutions.

(3) To coordinate and stimulate the educational forces available in the cooperating institutions.

(4) To bring the Bureau of Education into closer relations with the educational agencies of the country, and thereby to promote the Bureau's understanding of educational needs and problems, and to extend its range of effective service.

This move upon the part of the Bureau of Education is significant. It means first a closer identification of the Bureau with the schools of education in the larger state universities. It also means that the United States Bureau of Education is identifying itself with the rapidly developing recognition of and provisions for educational research. Within a period of little more than five years there has developed a new type of department in the field of education, namely a department which has for its particular function the stimulating and directing of educational research. The larger portion of this research is carried on in cooperation with public schools. The recognition of this development by the United States Bureau of Education is particularly significant at this time when an effort is being made to secure a larger recognition for education throughout the country.

From the standpoint of the Bureau of Education, this move will mean that it will assume a larger place in the educational activities of the country. It is a lamentable fact, but nevertheless true, that the recognition given to education by the government is far less than that accorded to this field by most governments. If the establishment of research stations of the Bureau does no more than increase the prestige of the United States Bureau of Education, the project will be justified.

National Association of Directors of Educational Research

(E. J. Ashbaugh, *Secretary and Editor*)

All aboard for Cleveland!

There is every reason why this meeting should be the banner meeting of the National Association of Directors of Educational Research. The program has been prepared earlier than ever before. A larger amount of time will be given to the discussion of the problems of research men. Every member is urged to go through the program carefully and then decide that he cannot afford to miss this meeting.

Special attention is called to the closed meeting on Monday, February 23. This is to be a meeting for members only and will be devoted to intimate discussion of problems of research. Each member should come to the meeting prepared to submit a small list of carefully defined problems for this discussion. From the standpoint of the membership it should be the most valuable day of the whole week.

In order to get off right foot first with the Journal, your secretary has sent out a notice to the members asking their intention concerning continuing membership this next year. Almost 100 percent replies have been received and with but a single exception the statement has been affirmative. The one negative vote is from a former member who is not now engaged in research work. A few have pledged themselves for membership for life. This is the spirit that wins.

Since the writing of the notes for the last issue, word has reached us that the five million dollar bond issues that were then pending in Omaha and Oakland were both carried by a good substantial majority. There is every evidence that the great American public is behind the public schools more emphatically than ever. It certainly vindicates also the impression which many of us have had that people are perfectly willing to tax themselves for the education of their children when the facts showing conditions and needs are placed before them in a clear, concise manner. Mr. Smith and Mr. Dickson should both receive the unanimous commendation of the members of the Association for the success of the work.

Mr. Shapleigh, Research Secretary, Buffalo Public Educational Association, Buffalo, New York, should be congratulated upon the issuance of an educational journal for the city—*School and Community*—two

issues of which have reached the secretary's desk. Both represent a very high degree of excellence in both content and composition. Other school communities of large size can certainly afford to use similar means of keeping the public well informed. Wise publicity would very quickly drive out of existence the contemptible type of cartoon of schools and school conditions which so often disgraces the pages of our public press.

We are glad to welcome to membership in our Association: Charles L. Harlan, Department of Educational Measurement and Standards, Lewiston State Normal School, Lewiston, Idaho, and John K. Norton, Assistant Director, Bureau of Research and Guidance, Oakland Public Schools, Oakland, California.

If a member knows of any directors of educational research who are not now members, he will confer a favor upon the Association by recommending to the secretary such of them as he believes to be acceptable for membership. If this notice should come to the attention of any one who is not a member of the Association but who is engaged primarily in educational research, a letter to the secretary will bring him information concerning eligibility to membership and the general scope and benefits of the Association.

Please remember that no further issues of the news bulletin will be made. New items from the various members are to be given publicity through this department. The secretary urges the members to feel under personal obligation to send him items concerning their work. Whenever you have completed a bit of research which you feel has been helpful to yourself or to your community; whenever you start something which is out of the regular routine; whenever you have a piece of projected work to which you think other members might contribute some comparable data, please spend a few minutes time and a postage stamp in getting these data to the secretary.

At the closed meeting of the Association which will be held on Monday, February 23, topics of especial interest to the members will be taken up. None but members will be expected to attend unless they are particularly invited to do so. Among others, Dr. Thorndike will address the closed meeting by invitation. He is going to talk on "Measurements of instruments of instruction" (i.e., textbooks). He intimates that he will "start something."

A number of topics of general interest to members will be proposed and leaders of discussion will be appointed. The following topics have been suggested: the improvement of instruction by the use of standardized tests, the evaluation of tests, group intelligence tests. If any of the members wishes to have a topic discussed he should communicate the fact to the president at once. While the meeting will not be of a formal character it will nevertheless be definitely planned; and it may be difficult to secure the discussion of a topic unless a place has been arranged for it.

For the use of the closed meeting the management of the Hotel Statler has placed at the disposal of the association a committee room having a

seating capacity of forty. Adjoining this room there will be a private dining room where luncheon and dinner will be served to the members. The use of the committee room is given to the association gratis; but the members will be expected to eat luncheon and dinner in the dining room assigned to the Association. They would anyway!

At this meeting a preliminary report of the committee on standards will be rendered. The report will be open for discussion. The closed meeting will also afford an opportunity for an informal discussion of business matters. This will enable us to dispose of them quickly at the business meeting Thursday evening. If any member has an item of business which he desires to have debated he may bring it up at the closed meeting.

The following papers are announced for the public meeting to be held Thursday morning and afternoon, February 26:

W. W. Theisen. "Provision for individual differences in the teaching of reading."

H. A. Brown. "Formulation of method in reading in the light of recent investigations."

William S. Gray. "Significant tendencies in the diagnosis of reading accomplishment."

Edward L. Thorndike. "Intelligence tests for college entrants."

F. J. Kelly. "Results of three methods of teaching the fundamentals of arithmetic, measured by the Courtis Tests."

Cecile White Flemming. "Reading ability and intelligence."

S. A. Courtis. "Report of committee on standards."

Leonard P. Ayres. "The comparative effectiveness of state school systems."

Arthur W. Kallom. "Reproduction as a measure of reading ability."

J. W. Richardson. "The campaign method in elementary education."

As will be noticed, the program is largely grouped around the ideas of reading and intelligence testing.

The annual dinner will take place on Thursday evening at 6:30 o'clock at the Hotel Statler. Price per plate $3.00.